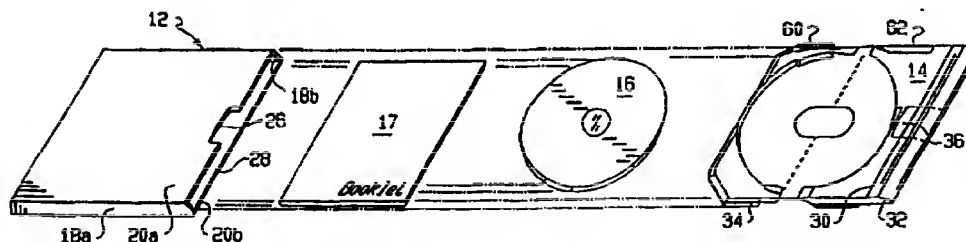




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(54) Title: STORAGE CONTAINER FOR INFORMATION-BEARING DISC DEVICES



(57) Abstract

A storage container (10) comprising an outer shell (12) and an insertable drawer member (14) configured and dimensioned for receiving and storing information-bearing discs (16) and accompanying printed matter (17). The insertable drawer member (14) includes features (78) to store the discs (16) by contacting non-information bearing surfaces thereof as well as structure (32, 36) for selectively retrieving the printed matter together with the disc (16) from the outer shell (12). The container (10) of the invention additionally comprises a tamper seal (86) formed integral therewith which fractures the first time the drawer member (14) is withdrawn from the shell (12) for determining whether the storage container (10) has ever been opened to access its contents after it was sealed at the factory.

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10 STORAGE CONTAINER FOR INFORMATION-BEARING DISC DEVICESTechnical Field

The invention relates to storage containers for information-bearing disc devices, such as compact discs ("CD's"), compact
15 disc, read-only-memory ("CD-ROM") devices, digital versatile discs ("DVD's") and video laserdiscs as well as for the printed instructional or advertising matter provided with such discs.

Background of the Invention

20 Compact discs were originally designed as a storage and reproduction medium for digitalized music programs. CD-ROMs, on the other hand, are utilized for storing text and graphics, as well as for audio information. Digital video discs are expected to become popular in the near future as a medium for recording
25 video information. Discs created for these purposes have a plastic-coated, aluminized reflective surface containing digitalized information on one side thereof.

In order to access the program encoded upon, for example, an audio CD or DVD, an infrared beam from a
30 semiconductor laser is focused upon the information bearing surface through a series of lenses and prisms. The laser light which strikes the surface is then converted into a digital electronic signal. The resultant signal is then decoded and fed through an electronic filter, converting it from digital form
35 into an analog signal suitable for any hi-fi or video amplifier.

A protective plastic coating on the surface of information-bearing discs of the type described herein prevents

dust or debris from reaching the underlying reflective metal surface. Scratches or blemishes in the protective coating can thus interfere with the laser light beam.

One common cause of such damaging scratches is the removal or insertion of such information-bearing disc devices from or into, respectively, a molded plastic storage case of the type commonly used to hold such discs. Presently, the most common type of container utilized for this purpose is the well known "jewel box" case (hereinafter referred to simply as the "jewel box"), so-called due to the hinged manner in which it is opened. The jewel box is described, for example, in International Publication No. WO 86/07182. However, the jewel box is difficult to manipulate and contains many sharp edges which can scratch or gouge the information-bearing surface of the disc if a disc is carelessly handled, resulting in a loss of some or all of the information contained thereon.

Improved storage containers capable of enhanced protection of the outer, information-bearing surface on such disc devices are disclosed in U.S. patent Nos. 4,771,883, 4,881,640 and 4,899,875 to Herr et al. These references describe plastic storage containers of a type comprising a slidable drawer member dimensioned and configured to receive and store information-bearing discs within an outer shell in a manner that significantly diminishes the chance of scraping or otherwise damaging the information-bearing surfaces of the disc.

Further to the above, however, a booklet containing advertising and/or informational matter concerning the contents of the disc, sometimes including photographs and/or drawings, is typically included in the storage container with the discs. This material, referred to herein as "printed matter" or a "booklet" may, for example, describe or illustrate the musical or informational contents encoded upon the disc, provide song titles or information about the recording artist, set forth the lyrics of the songs recorded thereon, or provide instructions on how to access the material upon, e.g., a CD-ROM.

The prior art jewel box typically stores such booklets adjacent the inner front panel of the container where they are held in place by several positioning tabs molded integrally upon the inner surface of the front panel. When the jewel box is
5 opened to retrieve the disc, the booklet thus remains secured against the inner surface of the front panel by the tabs. To retrieve the booklet, the user must slide or bend the printed matter out from under the tabs. This operation tends to be rather awkward and often causes damage, i.e., bending, tearing,
10 etc., to the booklet. The storage containers disclosed in U.S. patent Nos. 4,771,883, 4,881,640 and 4,899,875, while providing, as discussed above, enhanced protection against damage to the information-bearing surface of the disc, also provide a somewhat more "user friendly" means for accessing the printed matter, but
15 these containers do not, however, entirely resolve the difficulties involved in obtaining access to the printed matter stored within the housing.

The storage container also must include an insert or card containing information regarding the disc which is in the
20 container. This card serves the important packaging function of informing the consumer of the contents of the disc and, as such, is an important selling aide.

Another important consideration with regard to the packaging for information-bearing discs of the type described
25 herein concerns "pirating" of the copyrighted material encoded onto the disc. This activity is commonly engaged in by consumers who, after purchase, open the package and copy the recorded material from the disc to a different medium, e.g., a cassette. Such individuals thereafter return the devices to the retailer
30 for a refund of the purchase price claiming the disc is a duplicate of one they already own or is undesirable for some other reason.

To prevent such pirating, while still permitting the public to rightfully return undesired discs, many wholesalers
35 utilizing the jewel box presently apply so-called "tamper seals",

around the outer surfaces of the container. One commonly used tamper seal is a mylar strip which wraps around the edges of the container that are opened to access the disc. The strip is therefore typically broken or removed in order to access the disc. The idea is that retailers can accept returned discs in which the seal has not been broken or removed in the belief that the material was not copied. Such seals can be bypassed, however, by prying open the hinged side of the jewel box, thus permitting access to the disc contained therein without damaging or removing the seal. In addition, these strips are expensive in terms of the material and labor required to apply them to the container. Further, they are difficult to remove and thus provide an annoying obstacle to the average consumer who seeks access to the package contents for solely legitimate purposes.

Summary of the Invention

The present invention thus relates to a novel container for storing and securing information bearing disc devices such as CDs, CD-ROM's, video laserdiscs, DVD's and the like, as well as the printed matter that commonly accompanies such discs, which overcomes the disadvantages of the prior art packaging discussed above.

The container of the invention generally comprises an outer plastic housing or shell containing a slidable drawer member having top and bottom segments hinged together. The drawer may be partially removed from the shell by sliding it outwardly to selectively access the disc and/or the printed matter. The drawer is configured and adapted for securing a disc of the type described above during periods of non-use.

The invention includes a number of individual features which facilitate use of the container as well as the manufacturing process. These features include, separately and in combination:

(a) disc retention means which grip a disc on its non-information bearing periphery at a plurality of separate locations;

5 (b) a "book grabber" flange within the handle which is adapted to selectively engage a booklet resting on top of the drawer so that the booklet can be removed with the drawer when desired;

10 (c) flexible side walls on the sides of the drawer which engage the shell in such a way as to stabilize the drawer within the shell and reduce the likelihood of jamming or catching when the drawer is moved with respect to the shell;

(d) an advertising insert which is equal in size to the entire rear panel of the container and which may include up to three spines on which information may be printed; and

15 (e) ramp like projections molded into the sidewalls of the shell having specially shaped leading and trailing edges which assist in guiding the various parts (such as the booklet, advertising insert, and drawer) into the shell and preventing withdrawal of some of the parts (such as the advertising insert
20 and drawer) from the shell.

In addition to the foregoing, the invention also includes a number of subsidiary features which may be used separately or in combination with any of the foregoing features. These features include a lid construction which can be folded
25 into a rectangular form yet which is nestable in its unfolded form; special reinforcing ribs on the undersurface of the drawer to facilitate nesting of the drawers and also insertion of the advertising insert into the shell; and a series of beveled surfaces on the leading edges of the shell to assist in
30 introducing the drawer into the shell during the manufacturing process. In the case of a container (such as the DVD container) which may be stored in a position with the disc retention means at the top in which case the disc may be dislodged from the disc retention means, the invention also contemplates supplemental

holding means for holding the disc within the disc retention means against the force of gravity.

Other useful features are also described and claimed in the following specification.

5

Brief Description of the Drawings

Fig. 1 is a perspective view of a first embodiment (Embodiment "All) of a storage container constructed according to the present invention;

10 Fig. 2 is an exploded perspective view of embodiment A shown in Fig. 1;

Fig. 3 is a perspective view of the partially-opened storage container of Fig. 1;

15 Fig. 4 is a sectional view taken along the line 4-4 of Fig. 1;

Fig. 4A is a view similar to that of Fig. 4 illustrating one means by which the printed matter is extracted from the storage container;

Fig. 5 is an exploded view of the container shell;

20 Fig. 5A is a partial sectional view taken along the line a-a of Fig. 5;

Fig. 5C is an enlarged perspective view of a portion of Fig. 5;

25 Fig. 5D is a partial sectional view taken along the line d-d of Fig. 5;

Fig. 5E is a partial side view of section c in Fig. 5;

Fig. 6 is a side view of a drawer member constructed according to the present invention;

30 Fig. 7 is a top plan view of the drawer member of Fig. 6;

Fig. 7A is a partial sectional view taken along the line a-a in Fig. 7;

Fig. 7B is a partial sectional view taken along the line b-b in Fig. 7.

Fig. 7C is a partial sectional view taken along the line c-c in Fig. 7;

Fig. 8 is a partial sectional view of a second embodiment (Embodiment "B") of a storage container constructed
5 according to the present invention;

Fig. 9 is a partial perspective view of a third embodiment (Embodiment "C") of a storage container constructed according to the present invention;

Fig. 9 is a partial sectional view of the storage
10 container of Fig. 9;

Fig. 10 is a partial perspective view of a fourth embodiment (Embodiment "D") of a storage container constructed according to the present invention;

Fig. 10A is a partial sectional view of Fig. 10;

15 Fig. 11 is a partial perspective view of the storage container of Embodiment A illustrating one embodiment of the tamper seal of the invention;

Fig. 12 is a partial sectional view taken along the line a-a of Fig. 11 with the storage container in the closed
20 position;

Fig. 13 is a partial sectional view taken along the line b-b of Fig. 11 as the drawer member is being pulled outwardly from the shell;

Fig. 14 is a partial perspective view of a storage
25 container of the invention incorporating an alternate tamper seal embodiment;

Fig. 14A is a partial sectional view of the tamper seal of Fig. 14 taken along the line a-a of Fig. 14;

Fig. 15 is a partial sectional view of a storage
30 container of the invention incorporating yet another embodiment of the tamper seal;

Fig. 15A is a partial sectional view of the tamper seal of Fig. 15 taken along the line a-a of Fig. 15 as the drawer member is being pulled from the shell;

Fig. 16 is a partial perspective view of a storage container of the invention incorporating still another embodiment of the tamper seal;

5 Fig. 17 is a cross-sectional view of a plurality of storage containers constructed according to the present invention as they appear stacked within a storage unit;

Fig. 18 is a perspective view showing the components of a storage container intended for use with digital video discs;

10 Fig. 19 is an exploded view of the shell of the DVD storage container;

Fig. 20 is a magnified perspective view of the upper portion of one of the shell side panels;

Fig. 21 is a top view of the DVD shell;

15 Fig. 22 is a side sectional view along the line 22-22 of Fig. 21;

Fig. 23 is a sectional view along the line 23-23 of Fig. 22;

Fig. 24 is a sectional view along the line 24-24 of Fig. 21;

20 Fig. 25 is a sectional view along the line 25-25 of Fig. 21;

Fig. 25A is a sectional view along the line 25A-25A of Fig. 25;

25 Fig. 26 is a top sectional view of a section of the shell and drawer;

Fig. 27 is a perspective view showing the shell and advertising insert or tray card before it has been inserted into the shell;

30 Fig. 28 is a side sectional view of the top portion of the shell with the tray card inserted;

Fig. 29 is a front plan view of a drawer as it appears after the molding process;

Fig. 30 is a rear plan view of the drawer as it appears after the molding process;

35 Fig. 31 shows two stacked or nested drawers;

Fig. 32 is a side sectional view showing the handle or lid after it has been completed;

Fig. 33 shows the upper portion of a complete storage container with the drawer extended from the shell and the disc and booklet in position to be inserted;

Fig. 34 is a top plan view partially broken away of a complete storage container;

Fig. 35 is a sectional view along the line 35-35 of Fig. 34;

Fig. 36 is a sectional view along the line 36-36 of Fig. 34;

Fig. 37 is a magnified sectional view of the container showing how the flexible side wall of the drawer prevents complete withdrawal of the drawer from the shell;

Fig. 38 is a sectional view along the line 38-38 of Fig. 34;

Fig. 39 is a sectional view along the line 39-39 of Fig. 34 showing details of the disc retention means;

Fig. 40 is a plan view of a second embodiment of the invention including two disc retention flanges;

Fig. 41 is a plan view of a further embodiment of the invention showing special disc retention features for use when the container rests on the handle;

Fig. 42 is a side sectional view along the line 42-42 of Fig. 41;

Fig. 43 is a sectional view along the line 43-43 of Fig. 41;

Fig. 44 is a side view of a flexible side wall in accordance with a further embodiment of the invention;

Fig. 45 is a sectional view along the line 45-45 of Fig. 44;

Fig. 46 is an enlarged top plan view of a stop member for use with the flexible wall construction of Fig. 44;

Fig. 47 is a sectional view similar to Fig. 45 showing a flexible wall construction in accordance with a further embodiment of the invention; and

Fig. 48 is a sectional view showing a side wall construction in accordance with still a further embodiment of the invention.

Detailed Description of the Preferred Embodiments

Referring initially to Figs. 1, 2 and 3, there is illustrated a first embodiment "A" of the novel storage container 10 of the invention. Storage container 10 comprises an outer plastic shell 12 within which is slidably engaged an insertable drawer member 14 (referred to herein as the "drawer"). The storage container 10 is configured and designed for storing and selectively accessing an information-bearing disc 16 alone or together with printed matter 17, typically provided therewith.

As used herein, the terms "top" and "upper" refer to the end of the storage container or a component thereof opposite bottom member 22. The terms "bottom" and "lower" refer to the end at or adjacent the bottom member 22. The term "front" is used herein to refer to that portion of the container formed by the closure 20a whereas the "rear" of the container is the rear panel 20b.

Fig. 1 illustrates container 10 in the storage mode, i.e., as it appears in its closed configuration. The drawer 14 is substantially enclosed within the shell 12 (except for lid portion 32 described below) along with the disc 16 and the booklet 17 (not shown). Shell 12 is preferably molded of a non-opaque thermoplastic composition such as polystyrene to permit the retail customer to visually observe its contents. The drawer 14 includes a lid portion 32 along its upper edge which contacts an open end of shell 12 to completely enclose disc 16 and booklet 17. A tray card (not shown) ordinarily would also be included within the package.

The spatial interrelation among the contents of storage container 10 in Fig. 1 are shown in Fig. 2. Shell 12, preferably formed, as described above, of a 35 molded thermoplastic, e.g., polystyrene, comprises closure 20a positioned directly above
5 printed matter 17, rear panel 20b behind the drawer 14 and side panel members 18a, 18b, all of which are conjoined at bottom member 22 (shown in Fig. 5). Thus, the upper open end of shell 12 opposite bottom member 22 permits insertion and removal of drawer 18. This open end is sealed by lid 32 when drawer 14 is
10 closed. Closure 20a defines a cut-out portion 26, preferably rectangular in shape, along its upper edge. The function of this cut-out 26 is as described below.

As noted above, drawer 14 is configured to contact only the non-information bearing surfaces of disc 16 when the disc is
15 received or removed. Extending downwardly from lid 32 and parallel to the front face thereof is a flexible flange member 36 which is adapted to pivot through the cut out 26 in closure 20a upon the application of a downward force thereon by the user's finger when the drawer member 14 is fully inserted into the shell
20 12.

Further to the above, formed integral with and extending laterally at approximately a 45° angle from the lower left and right sides of drawer 14 are flexible side wall members 34. When the drawer 14 is positioned within the shell 12, the
25 side wall members 34 extend from the drawer 14 to contact the interior of the panel members 18a, 18b, 20a and 20b which form shell 12 to position the drawer within the shell and to prevent (in a manner described below) drawer 14 from sliding out of shell 12 during the removal of disc 16 or in the event that the
30 container 10 is turned upside down.

Fig. 3 illustrates container 10 of the invention where drawer 14 is pulled outwardly from the top of shell 12 and top segment 62 of drawer 14 is rotated in a clockwise direction to expose the printed matter 17 (and disc 16 which is hidden by
35 printed matter 17) to permit their removal from shell 12 by the

consumer. The "top" segment 62 of the drawer 14, as that term is used herein (see, e.g., the discussion of Fig. 7 below) is thus the upper portion of the drawer to which lid 32 is attached and which is capable of rotational movement away from disc 16 around a living hinge as described below. The segment of the drawer 14 that remains substantially within the shell 12 is thus referred to herein as the, "bottom" segment 60.

Referring now to Figs. 4 and 4A, the disc 16 and printed matter 17 are shown enclosed within the storage container 10. The disc 16 is secured upon the drawer 14 only along its non-information bearing surfaces, i.e., along the outer edge of the disc, such that when the drawer 14 is removed from the shell 12, disc 16 travels upwardly out of the shell with the drawer. The printed matter 17 is interposed between the disc 16 and the shell closure 20a. When the drawer 14 is pulled outwardly from the shell 12 any upward, i.e., out of the shell, sliding movement of the printed matter 17 is stopped when an upper edge of the printed matter 17 contacts retaining lip 24 projecting inwardly from the inner surface of the closure 20a (see Fig. 5B) at approximately the upper end 28 thereof.

As shown in Fig. 4A, for removal, the printed matter 17 is compressed by a force F exerted on the flexible flange member 36 by the user's finger which permits matter 17 to slide under the retaining lip 24 when drawer 14 is withdrawn from the shell 12. The printed matter is gripped between the flange member 36 and drawer 14 so that it can be removed from the shell 12 with the drawer 14. Thus, to selectively access the printed matter 17 with the disc 16, the user applies force F on the flexible flange 36 when withdrawing the drawer 14 from the shell 12. Alternatively, if only the disc 16 is desired, the drawer 14 can be pulled from the outer shell 12 without squeezing flange 36. Then the printed matter 17 remains in place below lip 24 when the container 10 is opened.

Fig. 5 illustrates the structure of shell 12. As stated previously, the shell 12 comprises rear panel 20b, front

panel, i.e., closure, 20a, two opposing side walls 18a and 18b and a shell bottom wall 22, all preferably formed of a molded thermoplastic. The closure 20a is separately molded from the remainder of the shell 12 and is preferably secured in place by
5 a process such as solvent welding or ultrasonic bonding. Optionally, closure 20a can be integrally molded with shell 12.

Closure 20a defines a cut-out portion 26, along its upper edge 28 which is preferably U-shaped to correspond to the size and shape of flange 36 on lid 32. One of ordinary skill in
10 the art would readily realize, however, that both cut-out 26 and flange 36 may be formed in a variety of shapes, so long as flange 36 is of a size and shape which enables it to be pivoted through cut-out 26. As also illustrated in Fig. 5, extending inwardly along the top end 28 of closure 20a is retaining lip 24. Lip 24
15 preferably extends from the left and right lateral edges of the cut-out 26, along the front face top edge 28 toward side walls 18a and 18b. The cut-out 26 extends downwardly from the top end 28 of closure 20a to a point below the lip 24 such that the flexible flange member 36 (shown in Figs. 1-4) can extend beyond
20 the lip 24 to compress printed matter 17 sufficiently to permit it to pass thereunder.

Fig. 5B illustrates the top edge 28 of shell front face 20a having lip 24 molded thereon. Lip 24 extends rearwardly into the interior of shell 12 just far enough to provide a stopping
25 surface for retaining the printed matter 17 (see Fig. 4) within the shell 12 when flexible flange 36 is not depressed, yet not far enough to prohibit flexible flange 36 from compressing printed matter 17 under lip 24 to facilitate removal of the printed matter from shell 12 when flange 36 is forced downward by
30 finger pressure exerted by the user (see, e.g., Fig. 4A).

Adjacent the lower end of the front face 20a near bottom member 22, tabs 42 extend from closure 20a into the interior of shell 12 to provide a lower stop for the printed matter 17 when the same is inserted into the container 10. As
35 shown in Figs. 4 and 5A, tabs 42 extend rearwardly from closure

20a to a point adjacent the face of the disc 16 to prevent any further downward progress of the printed matter. Moreover, as one of ordinary skill in the art would recognize, the shell bottom 22 can also serve as a stop for the printed matter 17 in cases where the printed matter 17 is oversized, i.e., longer than is normally found. Generally speaking, however, the distance between the lip 24 and the tabs 42 should be slightly greater than the length of the printed matter 17 such that the printed matter 17 can be readily retained therebetween.

10 The side walls 18a and 18b of the shell 12 are provided with stop members 44 protruding inwardly from the inner surfaces thereof at approximately the top edge 28 to provide abutting engagement with the corresponding flexible wall members 34 (see, e.g., Figs. 2 and 6-7) of drawer 14 when the drawer 14 is pulled
15 upwardly within shell 12.

 Fig. 5C is an enlarged top view of an upper corner portion of shell 12 which clearly illustrates one of the stop members 44 extending from the upper inner surface of shell side wall 18b.

20 Figs. 5C and 5E further illustrate a series of serrations or corrugations 46 along the outside upper end of side wall members 18a and 18b for providing a gripping surface for the user when sliding drawer 14 outwardly from the top of shell 12.

 Returning now to Fig. 5, the shell rear face 20b is
25 shown to be longer from bottom to top than the closure 20a. This leaves a top portion 52 of the shell rear face 20b which extends upwardly beyond closure 20a. Top portion 52 contains groove 48 which is configured and adapted for engagement with a finger member 150 on drawer 14 (described below in the discussion of
30 Fig. 12) which is utilized in forming tamper seal 86. Also along the top portion 52, on the outer surface of the rear face 20b, is a ramped surface 50 that enables users to slide their fingers behind lid 32 for extracting the drawer 14 from shell 12 to access the disc 16 and printed matter 17. Fig. 5D more clearly

shows the ramped surface as a reduction in the thickness along the upper edge of face 20b.

Figs. 6 and 7 illustrate drawer 14. The drawer is preferably molded of a thermoplastic composition such as a polyolefin (e.g., polypropylene) and is comprised generally of bottom segment 60 and top segment 62 connected by a living hinge 64. Living hinge 64 is a thin, flexible plastic web interconnecting segments 60 and 62. The flexibility of hinge 64 permits top segment 62 to be rotated in a clockwise direction with respect to bottom segment 60, from a first position which is essentially coplanar with bottom segment 60 to a second position at an angle of from about 0-180° therefrom which exposes disc 16 and printed matter 17 (see Fig. 3).

The drawer member bottom segment 60 comprises base 66 and an arcuate booklet seating surface 68 overlying at least a portion of base 66. Base 66 is configured as a very shallow semicone such that when the disc 16 is inserted towards disc seating surface 68, only the non-information bearing, i.e., outer peripheral edges of the disc 16 are actually contacted. In the preferred embodiment, the disc securing means comprises a plurality of arcuate flanges 69 extending outwardly from the booklet seating surface 68 and parallel to base 66. A series of disc capturing grooves 67 are thus formed between an underneath surface 69a, 69b of the flanges 69 and base portion 66 to grip the disc 16 by contact relation along its peripheral surfaces. The underneath surface of groove 69 is comprised of a double bevel surface to assist in guiding disc 16 into the disc capturing groove 67 and gripping the disc 16. Bevel surface 69a assists in guiding the disc into the groove and bevel surface 69b assists in gripping the disc.

Drawer bottom segment 60 further includes guide means 70 for directing disc 16 into disc capturing flanges 69 and the printed matter 17 into position adjacent closure 20a underneath lip 24. Guide means 70 is comprised of a pair of flexible, floating finger members 70. Fingers 70 are located along the

left and right sides of lower drawer segment 60 adjacent the edges thereof, extending upwardly toward living hinge 64 from disc seating surface 68 in the direction of upper drawer segment 62. The fingers 70 are slightly curved such that when the drawer 14 is extended from the shell 12 to expose the drawer top portion 62, fingers 70 flex away from the drawer to guide the disc into the disc capturing grooves 67. Fingers 70 contact only the non-information bearing surfaces of disc 16 when guiding the disc into engagement with grooves 67.

The drawer bottom segment 60 further includes flexible side wall members 34 (discussed above with regard to Fig. 2) that extend outwardly at an angle of approximately 45° along the lower edges of bottom segment 60 to contact the side walls 18a and 18b of shell 12 near or at the connections with the front face 20a (not shown) so as to position drawer 14 within the shell. As drawer 14 is pulled from the shell 12 in order to access the disc 16 and printed matter 17, the upper ends 72 of flexible side walls 34 contact stop members 44 (shown in Fig. 5) on side walls 18a and 18b to prevent further outward motion of the drawer 14. Thus, the distance from the ends 72 of the flexible side wall members to the living hinge 64 must be equal to or greater than the distance from the ends 72 of the stop member 44 bottom edge, which abuts the flexible side wall upper edge 72, to the top edge on the shell rear face 20b such that the drawer top segment 62 can rotate downwardly when the drawer 14 is partially extracted from the shell 12.

The drawer top segment 62 comprises a base 74 and an arcuate surface 76 overlying an upper portion of base 74. The top segment 62 is configured and adapted such that neither base 74 nor surface 76 actually contacts the disc 16. Rather, a plurality of tab members 78 extend substantially perpendicularly from the surface 76 to provide a rest for the non-information bearing surface of disc 16 when the storage container 10 is closed.

Arcuate surface 76 further includes a plurality of tabs 100 which extend from surface 76 and contact the lip 24 of shell 12. Tabs 100 assist in positioning the top drawer segment 62 between the shell closure 20a and the shell rear face 20b when the storage container 10 is closed.

Lid 32 of drawer 14 is integrally attached to the drawer top portion 62 along edge 80 (see, e.g., Fig. 6). A plurality of ribs 82 may be used to facilitate the attachment of the lid to the drawer and provide structural support to the lid.

The lid 32 is configured and adapted to close the open end of shell 12 when the storage container 10 is slid completely into the shell to totally enclose the disc 16 and printed matter 17. Preferably, the lid 32 is comprised of a relatively rectangular member 92 angled relative to shell faces 20a and 20b. Member 92 includes a gripping edge 94 located upon its underside and a top gripping edge 95 on its front outer surface. Flexible flange 36 extends from member 92 along edge 95 via a flex hinge 96. Lid 32 further includes a tamper seal 86 for providing an indication that the drawer 14 has been extracted from the shell 12. Seal 86 is discussed more fully below.

Turning now to Fig. 7A, lid 32 is generally formed, as noted above, of a rectangular member 92 having a gripping edge 94 on the rear surface and a top closing edge 97 configured and adapted to abut the shell closure 20a when drawer 14 is fully inserted. In addition, optional tabs 100 may be used. If used, tabs 100 extend forward from the front surface 76 of the lid to abut the inner surface of the shell front face 20a against the shell lip 24 providing a secure fit therewith.

Fig. 7B more fully illustrates the flexible flange 36 on lid 32. Flange 36 is attached to angled member 92 at the top gripping edge 95 of member 92 via flex hinge 96. In the embodiment shown, the flexible flange 36 extends to tip portion 98 such that the outer surface of the flexible flange 36 is substantially level and parallel with the outer surface of the closure 20a. The under surface of flange 36 is tapered such that

the flexible tip portion 98 is thinner than the shell front face 20a. In this manner, the flexible tip portion 98 is spaced from arcuate surface 76 on drawer 14 further than the shell closure 20a such that when the storage container 10 is closed, at least
5 a rear surface of flexible flange member 36 will fit into the cut-out portion 26 of shell 12, extending over the upper edge of printed matter 17 behind cut-out 26.

Thus, as shown in Figs. 4 and 4A, when a force F is exerted on the flexible flange 36, flange 36 rotates downwardly
10 about flex hinge 96 toward arcuate surface 76 on drawer upper segment 62 to abut against the printed matter 17. The flange thus compresses printed matter 17 sufficiently to permit it to pass under lip 24 as drawer 14 is withdrawn from shell 12.

In a preferred embodiment of the invention, a member 38
15 extends inwardly toward the printed matter from the underside of the flexible flange 36 to push the printed matter downwardly into the shell beyond shell lip 24 when it is desired to replace the printed matter into the shell. As shown in Fig. 4, the surface of the member 38 abutting the printed matter top edge is
20 configured and adapted such that the printed matter 17 is pushed below the shell closure lip 24 when the storage container 10 is fully closed. In an alternate embodiment, tab members 100 could also be utilized as means for forcing the printed matter 17 downwardly into the shell by configuring them to protrude from
25 the drawer lid 32 to a point below the shell lip 24 when the container 10 is closed.

Shown in Fig. 7B are tab members 78 which extend from base 74 of drawer top segment 62 to contact the non-information bearing surface of the disc 16. Tab members 78 extend from base
30 74 to a level that is substantially parallel with the disc capturing grooves 67 on the bottom segment 60 of drawer 14.

Also illustrated in Fig. 7B is the gripping edge 94 on the rear surface of the drawer lid 32 as well as gripping edge 95 on the front surface of the drawer lid 32. The consumer's grip
35 on back edge 94 is facilitated by ramped edge 50 (see Fig. 5D),

whereupon the user's finger slides up the ramp to the gripping edge 94 which provides a surface upon which to apply a pulling force. Front gripping edge 95 similarly provides a gripping surface upon which a pulling force can be applied. Thus, to open
5 the storage container 10 when access to printed matter 17 is not desired, the user simply grasps front gripping edge 95 and rear gripping edge 94 with one hand while holding the shell 12 with the other hand, preferably at serrations 46 (see Fig. 5E). The user thus simply pulls the drawer 14 and shell 12 apart from each
10 other such that the drawer 14 slides from the shell 12 until the side walls 34 on the lower drawer segment contact the stop members 44 on the inner surface of the shell side panels 18a,b such that the drawer top segment 62 is exposed and can be rotated in a clockwise direction away from disc 16. When access to the
15 printed matter 17 is desired, the user simply applies a force F to the flexible flange member 36, thus gripping the printed matter 17 between the flange 36 and the drawer 14 and pulls the drawer 14 from the shell 12.

As shown in Fig. 7C, extending from each side of drawer
20 bottom segment 60 is flexible finger 70 and flexible wall 34. As discussed above, finger 70 is angled away from drawer 14. The inner surface of finger 70 thus serves to guide the non-information bearing surface of the disc 16 into the disc capturing grooves 67. The flexible walls 34 extend rearwardly
25 from rear edges 102 on drawer bottom segment 60 for contact with the shell rear face 20b. Flexible walls 34 also extend forward to front edges 104 at approximately a 45° angle so as to contact the shell closure 20a. Walls 34 are further configured and adapted with a flat surface 106 for contacting the shell side
30 walls 18a and 18b. In this manner, walls 34 center the bottom segment 60 of the drawer member both laterally and longitudinally between the shell side walls 18a and 18b and between the shell closure 20a and the shell rear face 20b.

Fig. 8 presents a second embodiment, B, of a storage
35 container 110 according to the present invention. Components of

this embodiment that are similar to or the same as the corresponding components of embodiment A described above will retain their identification numeral for consistency. In embodiment B, the storage container 110 includes a shell comprising closure 20a, side walls 18a and 18b and rear face 120b. The shell is closed, as in Embodiment A, by lid 32 on drawer 14. The shell rear face 120b defines an aperture 122 configured and adapted for receiving a lever 124 which extends therethrough and which is utilized as described below for retrieving the printed matter 17. Lever 124 is rigidly connected to flexible flange member 36 and extends substantially perpendicularly therefrom through aperture 122 so as to be accessible to the fingers of the user.

To retrieve the printed matter 17 from the storage container 110 of embodiment B, the user applies a counterclockwise (i.e., toward drawer lid 32) force F to lever 124, which causes the lever 124 and flexible flange member 36 formed integral therewith to rotate about flex hinge 130. As flexible flange 36 rotates, it compresses and grips the printed matter 17 between flange 36 and the drawer 14 such that the printed matter 17 may then be extracted from shell 12 along with the drawer 14. To retrieve the disc 16 without the printed matter 17, the user extracts the drawer member by simultaneously pulling on the back gripping edge 94 and the front gripping edge 95 without triggering lever 124. As with embodiment A, any motion of the printed matter 17 will otherwise stop when the printed matter 17 contacts the retaining lip 24 (not shown) upon closure 20a.

Fig. 9 illustrates embodiment C of the storage container 210 according to the present invention. This embodiment retrieves the printed matter 17 with a pair of flanges having a scissor type grip. In embodiment C, the printed matter retrieval means 222 is comprised of a front flange 224 and a rear flange 226 which are adapted to grasp printed matter 17 with a scissor-like motion. Rigidly connected to rear flange 226 is a

lever 228 which extends from flange 226 through an aperture 231 defined by drawer lid 232 to the rear of container 10. Rear flange 226 and lever 228 are connected to the drawer lid 232 at a pivot point 230. When the drawer 14 is inserted within the
5 shell 12, the rear flange 226 slides behind the printed matter 17 while the front flange 224 slides in front thereof, directly above cut out 26 in closure 20a.

To retrieve the printed matter 17, the lever 228 is depressed by force F which causes it to rotate toward the drawer
10 14 and causes rear flange 226 to rotate forward such that printed matter 17 is compressed and gripped between front flange 224 and back flange 226. In this embodiment, closure 20a does not include a lip 24 for the retention of the printed matter 17 since the printed matter 17 is already compressed toward the shell
15 closure 20a by rear flange matter 17, the user can extend the drawer 14 from the shell 12 by either pulling the drawer lid 233 or the lever 228.

The shell 12 in embodiment C, is comprised primarily of the shell front face 20a which includes cut-out 26 and a shell
20 rear face 233 which defines aperture 234. Aperture 234 in rear face 232 provides a space into which lever 228 can rotate when depressed by a user.

Fig. 10 illustrates embodiment D of a storage container 310 according to the present invention. In embodiment D, the
25 shell 12 is comprised of closure 312, rear face 314, two side walls (not shown) and a bottom panel member (not shown). The shell closure 312 does not include a central cut-out as in the other embodiments described herein. Rather, the cut-out portion of closure 312 in the subject embodiment extends entirely across
30 the closure from one side wall to the other. Thus, as shown in Figs. 10 and 10A, the drawer lid 316 includes flanged portion 319 across the entire width of the lid which extends over the printed matter 17 lying below the cut-out portion of closure 312. Flange 319 further includes a substantially pliable portion 320. The
35 user can extract printed matter 17 with the drawer 14 by applying

a force F to the pliable portion 320 when pulling on the lid 316 to compress and grip printed matter 17 between pliable portion 320 and drawer 14. The pliable portion 320 can be a flange member attached to the drawer lid 316 via a flex hinge 322 or
5 could be comprised of a portion of lid flange 319 having a cross section which is thinner than the remainder of flange 319.

Fig. 11 illustrates a first embodiment of a tamper seal 86 for use with storage container 10 of the invention. Tamper seal 86 is comprised generally of a hooked member comprising a
10 shaft 150 and a filament 152 which are both formed integral with the storage container 10. Shaft 150 is connected at a first end to lid 32 by a hinge 154. The second end of shaft 150 is adapted to coact with the groove 48 in the shell rear face 20b as described below.

15 The filament 152 is a relatively thin elongated member having a first end and a second end. The first end of filament 152 is connected to the second end of the shaft 150, while the other end of the filament is connected to lid 32. Thus, the shaft 150 is connected to the drawer member lid 32 in two
20 locations, at hinge 154 and at the filament 152. The filament 152 provides a weak connection to the drawer lid 32 such that when the drawer 14 is pulled from the shell 12 for the first time, the filament 152 to lid 32 connection is broken due to the force exerted.

25 Fig. 12 illustrates the storage container of Fig. 11 in a closed condition. The shaft 150 extends to a tip portion in the form of a hook 156 which includes a curved or angled surface 160 and a second surface 162. Hook 156 is inserted into the groove 48 in the shell rear face 20b when the drawer 14 is
30 inserted into shell 12 for the first time. Preferably, two support members 158 extend from the hook 156 to abut the drawer member lid 32 and provide support for the shaft 150 when the drawer 14 is inserted into the shell 12 such that the filament 152 is not broken upon the insertion of the drawer 14.

Thus, when the drawer 14 is inserted into the shell 12 for the first time, the hook 156 slides over the top edge of the shell rear face 20b and into the seal groove 48, aided by the curved surface 160 and the support members 158. Once the drawer
5 14 is secured in the shell 12, the tabs 100 lock the drawer member between the shell closure 20a and the shell rear face 20b to prevent any movement of the drawer 14 except for lateral translational movement in a direction parallel to faces 20a and 20b of shell 12.

10 Fig. 13 illustrates how seal 86 operates when storage container 10 is opened. When the drawer 14 is pulled from the shell 12, flat surface 162 on shaft 150 abuts the edge of groove 48. The force of extracting the drawer 14 is greater than the strength of the filament 152 which therefore breaks, allowing the
15 shaft 150 to rotate about the hinge 154 and slide over the edge of groove 48. Thus, a user must break the filament 152 in order to open the storage container 10 for the first time. Subsequent openings would be unaffected by the seal 86. In this manner, interested parties such as retail merchants can readily observe
20 whether the filament 152 is intact to determine whether the storage container 10 has been opened.

Fig. 14 illustrates another embodiment of a tamper seal 170 formed integral with storage container 10. The tamper seal 170 comprises a finger 172 which is attached to the shell rear
25 face 20b within recess 174. In this embodiment, the finger 172 is integral with the shell 12 rather than the drawer 14 as in the previous embodiment described above.

Fig. 14A illustrates additional features of tamper seal 170 shown in Fig. 14. Finger 172 is attached to the shell rear
30 face via a breakable joint 176. Finger 172 comprises an upwardly extending portion abutting breakable joint 176 with a ramped surface 180 at the free end thereof. The ramped surface 180 is used to provide a sloped surface which the drawer can ride over when inserting drawer 18 into shell 12 without breaking joint
35 176. The upwardly extending portion 178 of seal 170 interacts

with the drawer 14 such that when the drawer is extracted from the shell 12, it abuts against finger 172, which rotates in a clockwise direction and snaps the breakable joint 176. Thus, one may observe whether finger 172 is intact to determine whether the storage container 10 has been opened.

Fig. 15 shows yet another embodiment of a tamper seal 182 for use with the container of the invention. Tamper seal 182 comprises finger 184, web 186 and leaf spring 188. The finger 184 has a first end attached to the drawer member lid 32 via a hinge 194 and is additionally attached to the drawer lid 32 by web 186. The leaf spring 188 is interposed between and attached to the drawer member lid 32 and the finger 184. Finger 184 further comprises a second end having a flat surface 190 and a ramped surface 192. The ramped surface 192 facilitates insertion of the drawer 14 into shell 12 while the flat surface 190 coacts with the groove 48 in the shell rear face 20b when the drawer is pulled out as described below.

Fig. 15A illustrates what occurs when the storage container 10 is opened. The flat surface 190 of finger 184 coacts with the edge of the groove 48 to rotate the finger 184 about the hinge 194 when the drawer 14 is slid from the shell 12. The initial rotation of the finger 184 breaks the web 186. This provides the indication that the storage container has been opened. Further rotation of the finger 184 causes the leaf spring 188 to snap into a second position, shown in phantom, which will maintain the finger 184 in the rotated position so that it does not engage with the groove 48 and thus interfere with subsequent openings and closings of the storage container 10.

Fig. 16 shows still another embodiment of tamper seal 200. Seal 200 comprises filament 202 which is connected at its ends to walls 204 of an aperture defined by drawer 14. Seal 200 further comprises a ramp 206 projecting from the inner surface of the shell rear face 20b. When the container is first sealed, filament 202 is proximate to ramp 206 on shell rear face 20b.

The filament 202 coacts with ramp 206 such that when the drawer 14 is extracted from the shell 12 for the first time, the filament 202 is broken by the ramp 206. An opening 205 is provided through the base of drawer 14 for the ramp 206 to fit
5 through as the drawer member is further extracted from the shell 12. It is also possible for the ramp 206 to project from the shell rear face 20b near the top thereof.

The various embodiments of the seals discussed herein can be incorporated in any of the storage container embodiments
10 A, B, C or D as well as other configurations. As is evident from the descriptions above, the seal embodiments are configured to provide abutting contact between the stationary shell 12 and the sliding drawer 14 so that a small filament or web member is severed upon the first translational movement of the drawer 14
15 when the same is pulled from the outer shell 12.

Turning now to Fig. 17, a plurality of storage containers 10 are shown stacked within a storage unit 210. Unit 210 is a representative example of various storage means presently on the market in which consumers house their disc
20 storage containers. In the alternate, however, consumers often dispense entirely with such storage units and simply stack their disc containers upon some flat surface, one atop the other. Typical prior art, i.e., "jewel box" disc storage containers, when stacked within or without multiple disc storage units, had
25 to be completely removed from the stack to access the discs stored therein. Fig. 17 illustrates how the present invention greatly increases the accessibility of both discs and/or printed matter stored in containers 10. More particularly, both the disc and the printed matter can be selectively accessed by simply
30 grasping lid 32 and pulling the drawer member from the outer shell, following which the top segment of the drawer is rotated downwardly away from the under surface of the disc as shown in Fig. 3. Due to the angled orientation of lid portion 32, the draw top segment rotates downwardly out of the way without substantial

interference from the lid of the next downwardly stacked container.

As described above, the drawer member includes lid portion 32 for substantially closing the top end of the outer shell. It is readily apparent that if lid 32 were perpendicular to the front and rear faces 20a and 20b of the shell, consumers would not be readily able to insert their fingers between the storage containers 10 for grasping the lid portion 32. Thus, the lid portion 32 of the container of the invention is oriented at an angle other than perpendicular to the planes of the front and rear faces 20a and 20b, preferably at an angle of approximately 45 degrees to these planes. This angle is not critical, however, and thus lid 32 can be oriented at any angle which facilitates access by the user's fingers. This angled orientation enhances accessibility to the drawer member by allowing the consumer's fingers (shown in phantom) to more easily grasp the lid portion 32 and pull the drawer member from the outer shell to access the disc therein.

Alternately, as noted above instead of comprising an angled planar surface (as shown), the lid may instead be molded in a geometric shape such as a crescent or half-moon for example to produce a pleasing decorative effect, while maintaining its functionality and ease of access. The shapes described herein are not limitative of the invention, however, as one of ordinary skill in the art would readily understand that a variety of additional shapes could alternatively be chosen. To facilitate access still further, the lid may include a gripping edge 94 located along the under surface of the lid portion 32, adjacent the rear face 20b when the drawer member is inserted into the outer shell. Additionally, shell rear face 20b may also include ramped surface 50 proximate to the lid gripping edge 94 when the drawer 14 is inserted into the shell 12. Ramp 50 makes it easier for the consumer to slide a finger behind the lid 32 for grasping the gripping edge 94 to extract the drawer 14 from the shell 12.

While it is apparent that the invention herein disclosed is well calculated to fulfill the functions and advantages above stated, it will be appreciated that numerous modification and embodiments may be devised by those skilled in the art and it is intended that the appended claims cover such modification and embodiments as fall within the spirit and scope of the present invention.

Digital video discs equal in size to current audio CD's are to be introduced in the near future. The discs will have optical data recorded on both sides and are known as digital versatile discs (DVD's). The preferred storage container for a DVD is slightly larger than the container for an audio CD, providing more space for graphics and enabling purchasers to easily distinguish DVD's from audio CD's. Figures 18-40 illustrate a preferred embodiment of the invention for use with DVD's.

The DVD container is similar in construction to the CD containers shown in Figs. 1-17. Because of the similarity of these embodiments, the same identification numerals are used in Figs. 18-40 to refer to elements which are substantially identical to the elements described in Figs. 1-17.

Fig. 18 is a perspective view of the DVD shell 12 and drawer 14. Both components are slightly longer and wider than their CD counterparts in Figs. 1-17.

The details of the shell construction are shown in Figs. 19-26. The shell 12 preferably comprises two separate components which are molded and joined together by ultrasonic welding. The first component includes the rear panel 20b, side panels 18a and 18b, and the bottom member 22. The second component is the upper closure 20a. To aid in the ultrasonic welding process, each of the side panels 18a and 18b includes a plurality of raised ridges 300 and a shorter tab 302 which fit into corresponding recesses within the underneath surface of the closure 20a. In Fig. 23, the recess within the closure 20a which receives tab 302 is shown at 304. The peripheral region 306 of

the closure 20a is thickened so that the recesses for receiving the ridges 300 and tabs 302 can be molded into the closure. The ridge 300 and tab 302 ensure precise registration of closure 20a with respect to the rear panel 20b when the shell components are
5 to be ultrasonically welded to form the complete shell. As in the previous embodiments, rear panel 20b forms substantially the entire rear panel of the assembled container.

In the embodiment of Figs. 18-40, the members 44 at the upper ends of the side panels 18a and 18b each include a lower
10 section 308 and an upper section 310 (see Figs. 20, 21 and 24). Each of the sections 308 and 310 include leading edges 308a, 310a, respectively, and trailing edges 308b and 310b, respectively. As used herein, the term "leading edge" refers to the edge which first contacts a member (e.g., the drawer, card or
15 booklet) when it is inserted into the tray. The "trailing edge" is the edge opposite the leading edge and first contacts a member (e.g., the drawer, card or booklet) when the member is withdrawn from the shell.

The leading edges 308a and 310a are bevelled to
20 function as guiding surfaces which facilitate introduction of a member into the shell. As shown most clearly in Figs. 24 and 26, the trailing edge 308b of the lower section 308 is reverse angled to inhibit withdrawal of the drawer from the shell as explained in detail below. The trailing edge 310b of the upper section
25 310, however, is bevelled in such a way as to facilitate withdrawal of the booklet from the shell.

In summary, the members 44 function to facilitate introduction of the drawer into the shell during the manufacturing process and introduction of the booklet into the shell during
30 usage. The members also function to prevent complete withdrawal of the drawer from the shell and to facilitate withdrawal of the booklet from the shell. In addition, as described below, the members 44 function to facilitate introduction of the tray card or advertising insert into the shell and to inhibit withdrawal of
35 the tray card after it has been introduced.

An important part of the overall package is the tray card or advertising insert which is analogous to a record jacket and serves essentially the same functions insofar as marketing the product is concerned. Fig. 27 shows the advertising insert 5 311 having two side spines 312 and a bottom spine 313. During the manufacturing process, the advertising insert 311 is inserted into the shell, the leading edges 308a of members 44 helping to guide the spines 312 and 313 into the shell. Once the advertising insert has been fully inserted into the shell, the 10 reverse angled trailing edges 308b of members 44 inhibit withdrawal of the insert by abutment against the upper edges of the spines 312. Because the insert 311 can be almost the same size as the rear panel 20b of the shell 12, which defines the rear panel of the entire container, and because three spines are 15 visible through the transparent shell, the graphic content of the insert is maximized, which is desirable.

The drawer 14 is shown in Figs. 29 and 30 which are top and bottom views, respectively. The major differences between the DVD drawer of Figs. 29 and 30 and the CD drawer shown in 20 Figs. 6 and 7 (apart from size) resides in the disc retention means and the lid.

The disc retention means in the DVD case comprise four flanges 69 which extend from the arcuate disc seating surface 68. Each flange extends over a complementary but slightly larger 25 opening 316 in the base 66. The openings 316 are formed to facilitate the molding process. The spaces between each of the flanges 69 and the base 66 form a disc capturing groove 67 into which the disc 16 may be inserted. The gap between the undersurface of flange 69 and the upper surface of the base 66 is slightly 30 less than the nominal thickness of the disc 16 so that when the disc is pushed against the arcuate seating surface 68, it is securely retained by virtue of the pressure exerted on the non-information bearing periphery of the disc by the flanges 69. The actual pressure is applied at the two points where each flange 69 35 joins the surface 68, for example, as shown at the two points 318

in Fig. 29. For this reason, the use of a number of flanges increases the pressure which retains the disc within the drawer. With the four flanges 69 as shown in Figs. 29 and 30, eight separate pressure points or gripping points are provided. Of course, more or less gripping points can be provided depending upon the number of flanges.

The flanges do not have to be arranged on a circular surface such as surface 68. For example, a polygonal arrangement would likely function as well to retain the disc in a secure position within the drawer.

As shown in Fig. 39, there is a shallow angle or bevel between the upper surface of base 66 and the undersurface of the flange 69. In the preferred embodiment, the undersurface of flange 69 (as viewed in Fig. 39) slopes upwardly from the horizontal and the upper surface of base 66 slopes downwardly. Because of the divergence of these two surfaces, which define the disc capturing groove 67, the device is able to apply pressure to the edges of discs which vary from the nominal thickness of 1.2mm, with thinner discs being inserted more deeply into the disc capturing groove 67 between the flange 69 and base 66. To further facilitate introduction of a disc into the grooves 67, each flange 69 includes a bevelled undersurface 69a.

The manufacturing process includes the step of inserting the tray card into the shell and then inserting the drawer into the shell. Those features of the construction which facilitate insertion of the card and drawer into the shell are of substantial importance; however, to facilitate the manufacturing process, it is also important that like parts be nestable or stackable. This is not a problem with respect to the shells, but the trays include special features which substantially improve its nestability. The most significant of these is the lid construction which is shown in Figs. 31, 32, and 33.

Unlike the CD container of Figs. 1-17, the DVD container does not include an angled or bevelled lid. The present invention provides a rectangular lid without diminishing the

nestability feature of the drawers. The tray is molded in the configuration shown in Figs. 29, 30, and 31 with a lid closure 320 attached to the upper end of the drawer top segment 62 by means of a living hinge 322. The flexible flange 36 which is
5 used to grab the printed material 17 is formed in the center of the lid closure 320 and functions essentially as described with respect to Embodiment of A. The printed matter in Fig. 33 or booklet 17 is substantially coextensive with the closure 20a of shell 12. Latch members 324 and 326 extend from the lid closure
10 320 and the top segment 62 (Fig. 32).

During the manufacturing process, the individual trays are stacked or nested as shown in Fig. 31. When a drawer is to be used, it is removed from the stack and the lid closure 320 folded about the living hinge 322 into the position shown in
15 Figs. 32 and 33. The latch members 322 and 324 engage each other in such a way that the lid closure cannot be unfolded without destroying the latch. Bevelled edges (not shown) may be provided on members 322 and 324 to help them slip over each other and lock.

20 When a large number of drawers are stacked on top of each other, the weight can be considerable. In order to prevent this weight from distorting the trays, the undersurface of the drawer is provided with two top ribs 328, two bottom ribs 330, and a central rib 332. Ordinarily, the tray card 310 is inserted
25 into the shell as part of the manufacturing process. However, the container may be sold without a tray card, in which case the tray card is inserted after the drawer and shell have been assembled. Typically, in such cases, the container is used as a replacement for a conventional jewel box in which case the tray
30 card would not include three spines. It can be difficult to insert a tray card into an assembled container. Beveling the leading edges 330a of the bottom ribs 330 (Fig. 31) and the leading edge of rib 332 helps to prevent jamming when a tray card is inserted into the assembled container.

As shown in Fig. 35, the surface of the top segment 62 of drawer 14 on which the printed material 17 rests is curved. By curving the support surface for the booklet in this fashion, the booklet, in its resting position, is curved away from the disc thus further reducing the likelihood of contact between the booklet and disc. The leading edges 24a of the booklet retention nubs 24 (Fig. 25) are bevelled to help in guiding the booklets into the drawer when the booklet is to be replaced. The trailing edges of the nubs 24, of course, retain the booklet in position when it is desired to remove the disc but not the booklet.

A pair of small projections 334 extending outwardly from the sides of the top drawer segment 62 near the lid provide a "click" when the drawer is inserted into the shell. The click occurs when the projections 334 pass over the members 44 and snap back into position after passing the trailing edges 308b (Fig. 26).

The bottom segment 60 of the drawer 14 includes bevelled surfaces 336 and 338 (Fig. 29) and a bevelled undersurface 340 (Fig. 31) to facilitate insertion of the drawer into the shell during the manufacturing process.

The bottom segment 60 also includes a radiused region 342 (Fig. 29) immediately above the arcuate seating surface 68 which helps to guide the booklet 17 into the shell and away from the disc. The area above the arcuate surface 76 of the top segment 62 is likewise bevelled at 344. These bevelled surfaces 342 and 344 serve the same purpose in that they reduce the likelihood of the booklet catching on the drawer when the booklet is inserted into the shell or when the drawer is either inserted into the shell or removed from the shell with the booklet in place.

The upper surface of the lower segment 66 also includes a bevelled surface 346 (Fig. 31) which helps guide the disc into the flexible fingers 70 and into the disc retention slot.

As used herein, the term "bevelled" is intended to refer to any shaping process which facilitates movement of one

member relative to another. For example, the bottom edges of the bottom drawer segment 60 could be curved to facilitate introduction of the drawer into the shell during the manufacturing process.

5 The semicircular recessed base 74 in the upper drawer segment 62 is illustrated as flat, i.e. each portion of the recess is recessed the same amount. On the other hand, the semicircular recessed base 66 of the lower segment 60 is formed in the shape of a shallow cone which means that the central
10 portion of the base is recessed more than its periphery. This shape in combination with the bevelled surface 346 helps to guide the disc into the fingers 70 and from there into the disc retention grooves between flanges 69 and base 66.

 One or more wedge shaped protrusions 345 may be molded
15 into the arcuate seating surface 76, the size and shape of the protrusion being such that when the upper segment is pivoted into the plane of the lower segment (i.e. the drawer is unfolded), the protrusion 345 will engage the edge of disc 16 and exert a slight force against the disc, urging the disc into the disc capturing
20 grooves 67. Rib 332 (Fig. 30) helps to ensure that the drawer is maintained level within the shell which is necessary if the protrusion 345 is to urge the disc into the disc capturing grooves.

 The flexible sidewall 34 serves the same function in
25 the DVD container as in the CD container of Figs. 1-18. The bevelled leading edges 34a of the sidewalls facilitate insertion of the drawer into the shell during the manufacturing process. The cross-sectional configuration of the sidewall 34 is shown in Fig. 36 as it appears when the container has been assembled, with
30 sidewall 34 exerting a force against spine 312 of the tray card 310. The phantom line position shows the unbiased position of the sidewall 34 as it appears after the molding process.

 Fig. 37 illustrates the way in which the upper ends 72
of the flexible sidewalls 34 abut against the trailing edges 308b
35 to prevent complete withdrawal of the drawer from the shell. As

shown in Fig. 37, the upper ends 72 may be bevelled to conform to the reverse angle of the trailing edges 308b so that abutment of the surfaces 72 and 308b tends to flare the sidewalls 34 making removal of the drawer from the shell difficult.

5 The flexible fingers 70 guide the disc into the disc capturing grooves 67 and also help to position the booklet 17 when it is being returned to the container so as to reduce the likelihood of contact between the booklet and disc. In the preferred embodiment, each of the fingers 70 has a compound curve
10 which means that the finger is curved in two planes. This is illustrated in Figs. 35 and 38. The flare of the fingers is relatively slight, the edges of the fingers facing the center of the container being slightly higher than the opposite or outer edges of the fingers.

15 Fig. 40 shows an embodiment of the invention in which two disc retention flanges 69a are used. In this case, only four gripping points 318 are formed.

 Figures 41-43 illustrate a further embodiment of the invention including features of special utility in the case of a
20 DVD container.

 In the description of the CD containers of Figures 1-17, for purposes of reference, the lid was deemed to be at the top or upper end of the container. In describing the DVD containers of Figures 18-40, this same frame of reference was
25 used for the sake of consistency. In fact, however, the DVD container will be presented to consumers with the lid resting on a support surface, i.e., with the lid at the bottom of the container. This means that if the disc 16 is not securely held within the disc capturing grooves 67, the disc may fall from the
30 grooves which is undesirable. Figures 41-43 illustrate supplemental disc retention devices for holding the disc against the disc seating surfaces when the DVD container is resting on the lid. It is contemplated that these devices, or either of them, could function as the disc retention means without the
35 gripping action of flanges 69.

The first of these features, shown in Figures 41 and 42, comprises an articulated disc retention strap 350 which includes two segments 350a and 350b joined by a living hinge 352. The strap 350 is connected diametrically across an elongated control opening 353 between the recessed portions 66 and 74 of the drawer segments 60 and 62, respectively, by living hinges 354 and 356. In this embodiment, the recessed portions 64 and 74 are not symmetrical, i.e. portion 74 is smaller than portion 64. A disc retention post 358 extends vertically from the upper surface of the strap segment 350a as shown in Fig. 42.

Because of the living hinges 352, 354 and 356, the articulated strap 350 can assume the position shown in dotted lines in Fig. 42 when the upper drawer segment 62 is folded away from the lower drawer segment 60.

The manner in which this disc retention feature functions is as follows. The disc 16 is inserted into the drawer when the upper segment 62 is in the folded position shown in dotted lines in Fig. 42. The segment 62 is then returned to its unfolded (solid line) position so that the drawer can be pushed into the shell. When the segment 62 is unfolded, it pivots upwardly (as viewed in Fig. 42) and the disc retention post 358 moves into the central aperture 359 within the disc 16. In accordance with the invention, the post 358 is positioned on the strap 350 so that the post 358 will exert a slight force upon the disc 16 when the drawer is unfolded, thereby urging the disc into the disc retention grooves 67. The post 358 also holds the disc in place when the container rests on the lid.

Another mechanism for helping to retain the disc involves the fingers 70. A curved disc retention rib 360 is molded on the undersurface of each of the fingers 70. The ribs 360 generally conform to the shape of the disc and, because the segments 60 and 62 are not symmetrical, the ribs 360 retain the disc when the container rests on the lid. The upper portion of each rib (as viewed in Fig. 41) may be flared outwardly to guide the disc 16 into ribs 360 when the disc 13 is inserted into the

drawer. The fingers 70 are sufficiently flexible to accommodate the small movement caused by the disc when it is inserted between the ribs 360. Once the disc has been fully inserted into the disc capturing grooves 67, the disc retention ribs 360 will tend
5 to hold the disc in its proper position within the drawer when the container rests on the lid.

Although Figs. 41-43 show an embodiment which includes both the disc retention strap 350 and the disc retention groove ribs 360, in practice, only one of these features is likely to be
10 used in a given construction.

As indicated above, the flexible sidewalls 34 perform an important function in that they stabilize the position of the drawer within the shell (by preventing rocking of the lower segment 60) and help prevent jamming or catching of the drawer in
15 the shell by exerting a constant force against the side walls of the shell. In the embodiments Figs. 18-40, the flexible sidewall 34 is actually part of a double wall construction (see Fig. 36) and is difficult to mold because of the "V" shape formed by the side wall. Figs. 44-48 show other types of flexible sidewall
20 constructions that can be used in accordance with the invention, which are easier to mold and/or which require less material. In Figs. 44 and 45 a single flexible wall 362 extends upperwardly from approximately the midpoint of the drawer. With this type of construction, the sidewall cannot engage the trailing edge of the
25 ramp 44 to prevent the complete withdrawal of the drawer after it has been manufactured. Hence, in this case, a separate stop member as shown in Figs. 44 and 46 may be incorporated into the drawer. As shown in Fig. 46, the stop member includes a small flexible tab 363 which is adapted to abut against the trailing
30 edge 308D when the drawer is pulled from the shell.

Other cross-sectional shapes for the flexible sidewalls are shown in Figs. 47 and 48. In Fig. 47 the flexible sidewall is shown at 364 extending from the upper surface of the drawer - generally the reverse of the flexible sidewall construction shown

in Figs. 18-40. In Fig. 48, two flexible sidewalls 366 and 368 extend from approximately the midpoint of the drawer.

CLAIMS

We claim:

1 1. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,

11 disc retention means, said disc retention means
12 comprising a recessed portion having a transverse surface and at
13 least two flanges extending inwardly from said transverse surface
14 to form disc capturing grooves between the flanges and the
15 recessed portion, and gripping points at the ends of the flanges
16 for holding the disc, the width of each disc capturing groove de-
17 creases in a direction away from the disc to accommodate discs of
18 different thicknesses.

1 2. A storage container for a disc containing
2 recorded data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the rear panel of the shell forms substantially the entire
6 rear panel of the container, and

7 a drawer for holding a disc, said drawer being
8 slidably receivable in the upper end of said shell, said drawer
9 having top and bottom segments hinged together, said bottom
10 segment including outwardly biased, flexible side walls adapted
11 to engage the inner surfaces of the side panels of said shell.

1 3. A storage container for a disc according to claim
2 2, further including an insert approximately the same size as the

3 rear panel of the shell and including at least one spine, at
4 least one side wall of the shell including a projection for
5 engaging the upper edge of said spine to resist removal of the
6 tray card from the shell.

1 4. A storage container for a disc according to claim
2 3, including retention nubs at the top of said rear panel for
3 retaining said insert.

1 5. A storage container for a disc according to claim
2 3, wherein the insert includes three spines.

1 6. A storage container for a disc containing
2 recorded data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and
6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell;
11 wherein the upper end of each side panel includes
12 an inwardly projecting member having a bevelled leading edge to
13 facilitate entry of a booklet and/or the drawer into the shell,
14 said inwardly projecting member includes a first portion having
15 a reverse angled trailing edge for preventing full withdrawal of
16 the drawer.

1 7. A storage container for a disc according to claim
2 6, wherein said inwardly projecting member further includes a
3 second portion having a bevelled trailing edge for facilitating
4 removal of a booklet from the shell.

1 8. A storage container for a disc containing
2 recorded data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and

6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,

11 wherein the upper end of each side panel includes
12 an inwardly projecting member having a bevelled leading edge to
13 facilitate entry of a booklet and/or the drawer into the shell,
14 and said drawer includes a side wall having a trailing edge
15 adapted to engage the trailing edge of said inwardly projecting
16 member to prevent full withdrawal of the tray, at least one of
17 said trailing edges being reverse angled.

1 9. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and

6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,

11 wherein said drawer includes a lid at its upper
12 end, a hinge connecting the lid to said top segment, said lid
13 having an open position to facilitate nesting of the drawers and
14 a closed position to facilitate handling of the drawer, and means
15 for holding the lid in its closed position.

1 10. A storage container for a disc containing recorded
2 data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and
6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,
11 wherein the upper end of each side panel includes
12 an inwardly projecting member having a bevelled leading edge to
13 facilitate entry of a booklet and/or the drawer into the shell
14 including small projections on the sides of said drawer, said
15 projections being located relative to said inwardly projecting
16 members so as to produce a click when the drawer is fully insert-
17 ed into the shell, said drawer includes reinforcing ribs on its
18 underneath surface, at least two of said ribs including sloped
19 leading edges to facilitate insertion of an insert into the
20 shell.

1 11. A storage container for a disc containing recorded
2 data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,
6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,
11 and
12 a booklet of printed matter adapted to rest on at
13 least a portion of said drawer, wherein the surface of said
14 drawer on which the booklet rests is curved.

1 12. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the side panels of said shell and the undersurface of said
6 closure include mating ridges and recesses, and

7 a drawer for holding a disc, said drawer being
8 slidably receivable in the upper end of said shell, said drawer
9 having top and bottom segments hinged together, said bottom
10 segment including outwardly biased, flexible side walls adapted
11 to engage the inner surfaces of the side panels of said shell, .

1 13. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,

11 disc retention means, said disc retention means
12 comprising a recessed portion having a transverse surface and at
13 least two flanges extending inwardly from said transverse surface
14 to form disc capturing grooves between the flanges and the
15 recessed portion, and gripping points at the ends of the flanges
16 for holding the disc; and

17 means for urging the disc into the disc retention
18 means.

1 14. A storage disc container according to claim 13,
2 wherein said urging means comprises at least one ramp shaped
3 projection on the upper segment of the drawer, said ramp shape

4 projection adapted to engage the edge of the disc as the upper
5 segment is unfolded.

1 15. A disc storage container according to claim 13,
2 wherein said urging means comprises an articulated strap inter-
3 connecting the upper and lower segments of the drawer, said strap
4 including a disc retention post adapted to engage the edge of an
5 opening in the disc as the upper drawer segment is pivoted from
6 its folded to its unfolded condition.

1 16. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having top and bottom segments hinged together, said bottom
9 segment including outwardly biased, flexible side walls adapted
10 to engage the inner surfaces of the side panels of said shell,

11 disc retention means, said disc retention means
12 comprising a recessed portion having a transverse surface and at
13 least two flanges extending inwardly from said transverse surface
14 to form disc capturing grooves between the flanges and the
15 recessed portion, and gripping points at the ends of the flanges
16 for holding the disc, and

17 flexible fingers formed on said lower drawer
18 segment for guiding said disc into said retention means.

1 17. A disc storage container according to claim 16,
2 wherein said flexible fingers overlap the upper drawer segment,
3 and disc retention projections formed on the under surfaces of
4 said fingers to retain the disc when the container is positioned
5 with the lower segment above the upper segment.

1 18. A disc storage container according to claim 17,
2 wherein the upper portions of said disc retention projections
3 help guide a disc into the disc retention means.

1 19. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc, the width of the disc capturing grooves
15 decreases in a radially outward direction to accommodate discs of
16 different thicknesses.

1 20. A disc storage container according to claim 19,
2 wherein said flanges each have a double bevel surface.

1 21. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the rear panel of the shell forms substantially the entire
6 rear panel of the container,

7 a drawer slidably receivable in the upper end of
8 said shell, said drawer having top and bottom segments hinged
9 together, said drawer including disc retention means for holding
10 a disc, said disc retention means comprising a recessed portion
11 having a transverse disc seating surface, at least two flanges

12 extending inwardly from said seating surface to form disc captur-
13 ing grooves between the flanges and the recessed portion, and
14 gripping points at the ends of the flanges for applying pressure
15 to the edge of the disc, and
16 an insert approximately the same size as the rear
17 panel of the shell and including at least one spine, at least one
18 side wall of the shell including a projection for engaging the
19 upper edge of said spine to resist removal of the tray card from
20 the shell.

1 22. A storage container for a disc according to claim
2 21, including retention nubs at the top of said rear panel for
3 retaining said insert.

1 23. A storage container for a disc according to claim
2 21, wherein the insert includes three spines.

1 24. A storage container for a disc containing
2 recorded data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and
6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc,
15 wherein the upper end of each side panel includes
16 an inwardly projecting member having a bevelled leading edge to
17 facilitate entry of a booklet and/or the drawer into the shell,

18 said inwardly projecting member includes a first portion having
19 a reverse angled trailing edge for preventing full withdrawal of
20 the drawer.

1 25. A storage container for a disc according to claim
2 24, wherein said inwardly projecting member further includes a
3 second portion having a bevelled trailing edge for facilitating
4 removal of a booklet from the shell.

1 26. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc,

15 wherein the upper end of each side panel includes
16 an inwardly projecting member having a bevelled leading edge to
17 facilitate entry of a booklet and/or the drawer into the shell,
18 said drawer includes a side wall having a trailing edge adapted
19 to engage the trailing edge of said inwardly projecting member to
20 prevent full withdrawal of the tray, at least one of said
21 trailing edges being reverse angled.

1 27. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc, and

15 a booklet of printed matter adapted to rest on at
16 least a portion of said drawer, wherein the surface of said
17 drawer on which the booklet rests is curved.

1 28. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a bottom member and
4 a closure, the upper end of said shell being open, and

5 a drawer slidably receivable in the upper end of
6 said shell, said drawer having top and bottom segments hinged
7 together, said drawer including disc retention means for holding
8 a disc, said disc retention means comprising a recessed portion
9 having a transverse disc seating surface, at least two flanges
10 extending inwardly from said seating surface to form disc captur-
11 ing grooves between the flanges and the recessed portion, and
12 gripping points at the ends of the flanges for applying pressure
13 to the edge of the disc, wherein the top and bottom segments of
14 the drawer each include seating surfaces for retaining the disc,
15 and wherein the areas adjacent the seating surfaces are bevelled
16 to facilitate movement of the drawer relative to the printed
17 material.

1 29. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc, and

15 means for urging the disc into the disc retention
16 means.

1 30. A storage disc container according to claim 29,
2 wherein said urging means comprises at least one ramp shaped
3 projection on the upper segment of the drawer, said ramp shape
4 projection adapted to engage the edge of the disc as the upper
5 segment is unfolded.

1 31. A disc storage container according to claim 29,
2 wherein said urging means comprises an articulated strap inter-
3 connecting the upper and lower segments of the drawer, said strap
4 including a disc retention post adapted to engage the edge of an
5 opening in the disc as the upper drawer segment is pivoted from
6 its folded to its unfolded condition.

1 32. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open,

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means comprising a recessed portion
10 having a transverse disc seating surface, at least two flanges
11 extending inwardly from said seating surface to form disc captur-
12 ing grooves between the flanges and the recessed portion, and
13 gripping points at the ends of the flanges for applying pressure
14 to the edge of the disc, and

15 flexible fingers formed on said lower drawer
16 segment for guiding said disc into said retention means.

1 33. A disc storage container according to claim 32,
2 wherein said flexible fingers overlap the upper drawer segment,
3 and disc retention projections formed on the under surfaces of
4 said fingers to retain the disc when the container is positioned
5 with the lower segment above the upper segment.

1 34. A disc storage container according to claim 31,
2 wherein the upper portions of said disc retention projections
3 help guide a disc into the disc retention means.

1 35. A storage container for a disc containing
2 recorded data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the upper end of each side panel including an inwardly
6 projecting member having a bevelled leading edge to facilitate
7 entry of at least one of a booklet, an advertising insert, or a
8 drawer into the shell, and

9 a drawer for holding a disc, said drawer being
10 slidably receivable in the upper end of said shell, said drawer
11 having top and bottom segments hinged together,
12 wherein at least a first portion of said inwardly
13 projecting member includes a trailing edge for preventing full

14 withdrawal of the tray, a second portion of said inwardly
15 projecting member includes a bevelled trailing edge for facili-
16 tating removal of a booklet from the shell.

1 36. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the upper end of each side panel including an inwardly
6 projecting member having a bevelled leading edge to facilitate
7 entry of at least one of a booklet, an advertising insert, or a
8 drawer into the shell, and

9 a drawer for holding a disc, said drawer being
10 slidably receivable in the upper end of said shell, said drawer
11 having top and bottom segments hinged together,
12 wherein the rear panel of the shell forms
13 substantially the entire rear panel of the container,

14 further including an insert approximately the same
15 size as the rear panel of the shell and including at least one
16 spine, at least one side wall of the shell including a projection
17 for engaging the upper edge of said spine to resist removal of
18 the tray card from the shell.

1 37. A storage container for a disc according to claim
2 36, including retention nubs at the top of said rear panel for
3 retaining said insert.

1 38. A storage container for a disc according to claim
2 36, wherein the insert includes three spines.

1 39. A storage container for a disc containing recorded
2 data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, the upper end of each side panel including an inwardly

6 projecting member having a bevelled leading edge to facilitate
7 entry of at least one of a booklet, an advertising insert, or a
8 drawer into the shell,

9 a drawer for holding a disc, said drawer being
10 slidably receivable in the upper end of said shell, said drawer
11 having top and bottom segments hinged together, and

12 a booklet of printed matter adapted to rest on at
13 least a portion of said drawer, wherein the surface of said
14 drawer on which the booklet rests is curved.

1 40. A storage container for a disc containing
2 recorded data, comprising:

3 a light transmitting shell having a rear panel, two
4 side panels, a bottom member and a closure, the upper end of said
5 shell being open, the rear panel of the shell forming substan-
6 tially the entire rear panel of the container,

7 a drawer for holding a disc, said drawer being slidably
8 receivable in the upper end of said shell and including a lid at
9 its upper end which is contiguous with the upper end of the shell
10 closure when the drawer is inserted into the shell, and

11 a printed insert within the shell adjacent the rear
12 panel, and visible through said rear panel, the insert covering
13 substantially the entire rear panel.

1 41. A storage container for a disc according to claim
2 40, wherein the insert includes at least one spine, at least one
3 side wall of the shell including a projection for engaging the
4 upper edge of said spine to resist removal of the insert from the
5 shell.

1 42. A storage container for a disc according to claim
2 41, including retention nubs at the top of said rear panel for
3 retaining said tray card.

1 43. A storage container for a disc according to claim
2 40, wherein said insert includes two side spines and a bottom
3 spine on which information can be printed, said spines being
4 visible through the side panels and bottom member of said shell.

1 44. A storage container for a disc containing optical-
2 ly recorded data, comprising:

3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and

6 a drawer slidably receivable in the upper end of
7 said shell, said drawer having top and bottom segments hinged
8 together, said drawer including disc retention means for holding
9 a disc, said disc retention means having a transverse disc
10 seating surface, and

11 means for urging the disc into the disc retention
12 means.

1 45. A storage disc container according to claim 44,
2 wherein said urging means comprises at least one ramp shaped
3 projection on the upper segment of the drawer, said ramp shaped
4 projection adapted to engage the edge of the disc as the upper
5 segment is unfolded.

1 46. A disc storage container according to claim 45,
2 wherein said urging means comprises an articulated strap inter-
3 connecting the upper and lower segments of the drawer, said strap
4 including a disc retention post adapted to engage the edge of an
5 opening in the disc as the upper drawer segment is pivoted from
6 its folded to its unfolded condition.

1 47. A disc storage container according to claim 46,
2 including flexible fingers formed on said lower drawer segment
3 for guiding said disc into said retention means.

1 48. A disc storage container according to claim 47,
2 wherein said flexible fingers overlap the upper drawer segment,
3 and disc retention projections formed on the under surfaces of
4 said fingers to retain the disc when the container is positioned
5 with the lower segment above the upper segment.

1 49. A disc storage container according to claim 48,
2 wherein the upper portions of said disc retention projection help
3 guide a disc into the disc retention means.

1 50. A storage container for a disc containing
2 recorded data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and
6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having upper and lower segments hinged together, disc retention
9 means, and means for holding said disc in said disc retention
10 means, said holding means comprises an articulated strap inter-
11 connecting the upper and lower segments of the drawer, said strap
12 including a disc retention post adapted to engage the edge of an
13 opening in the disc as the upper drawer segment is pivoted from
14 its folded to its unfolded condition.

1 51. A storage container for a disc containing
2 recorded data, comprising:
3 a shell having a rear panel, two side panels, a
4 bottom member and a closure, the upper end of said shell being
5 open, and
6 a drawer for holding a disc, said drawer being
7 slidably receivable in the upper end of said shell, said drawer
8 having upper and lower segments hinged together, disc retention
9 means, and means for holding said disc in said disc retention
10 means, further including flexible fingers formed on said lower

11 drawer segment for guiding said disc into said retention means,
12 said holding means comprising disc retention projections formed
13 on the under surfaces of said fingers to retain the disc when the
14 container is positioned with the lower segment above the upper
15 segment.

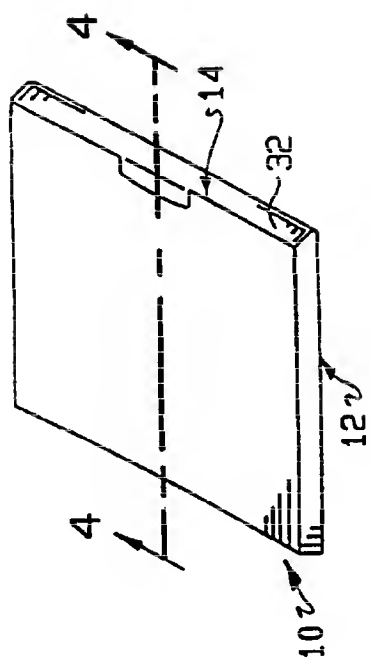


FIG. 1

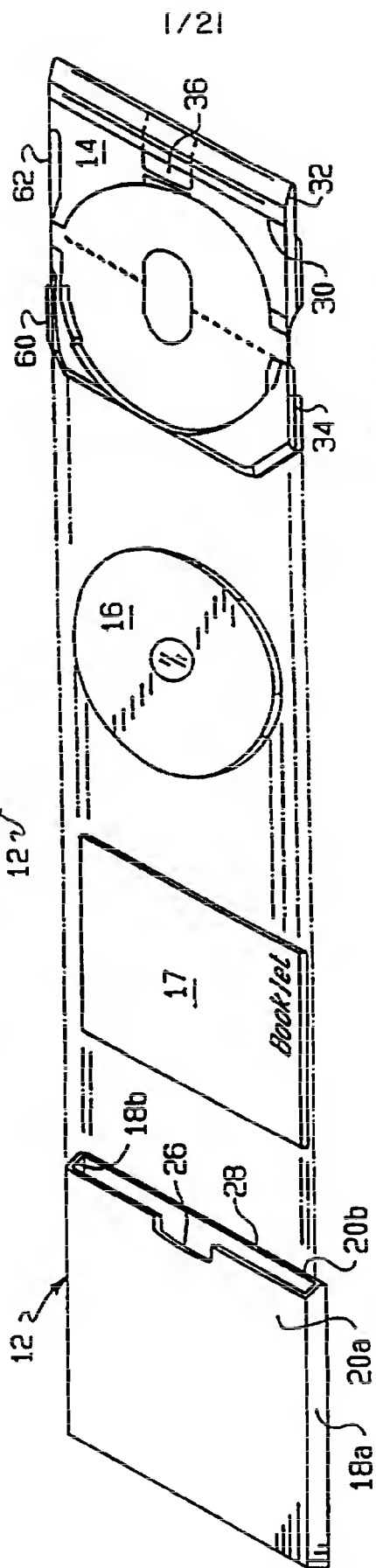


FIG. 2

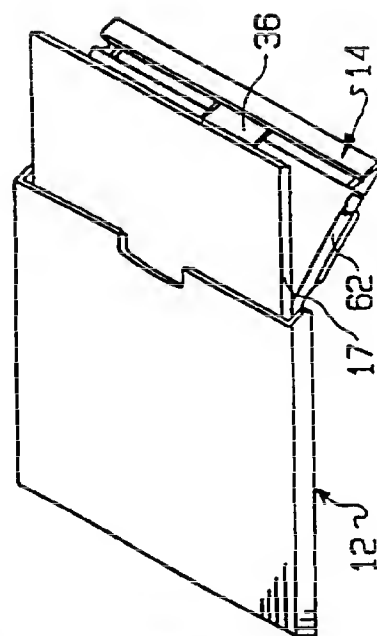


FIG. 3

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FIG. 4

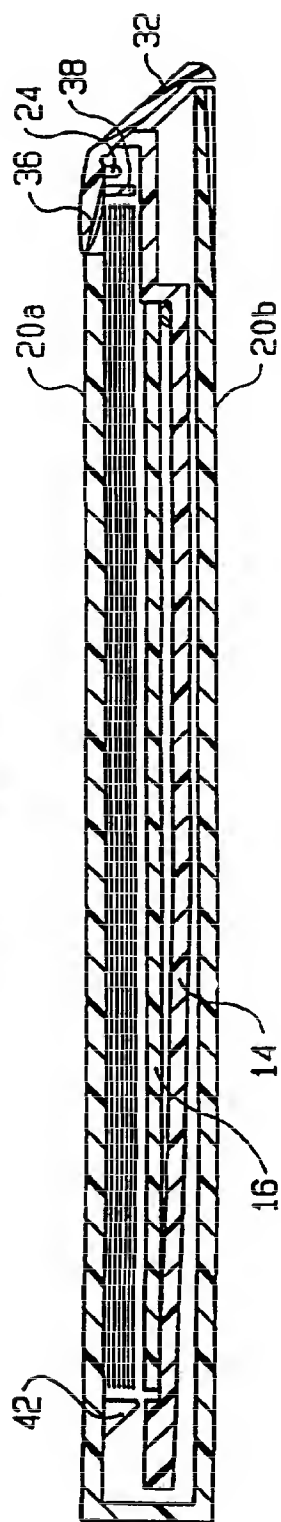
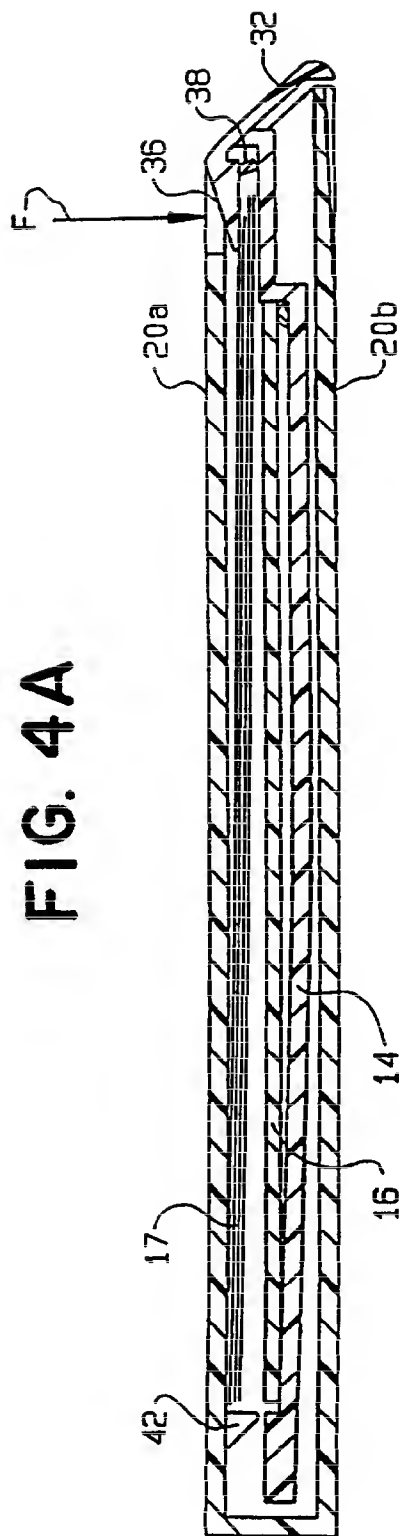


FIG. 4A



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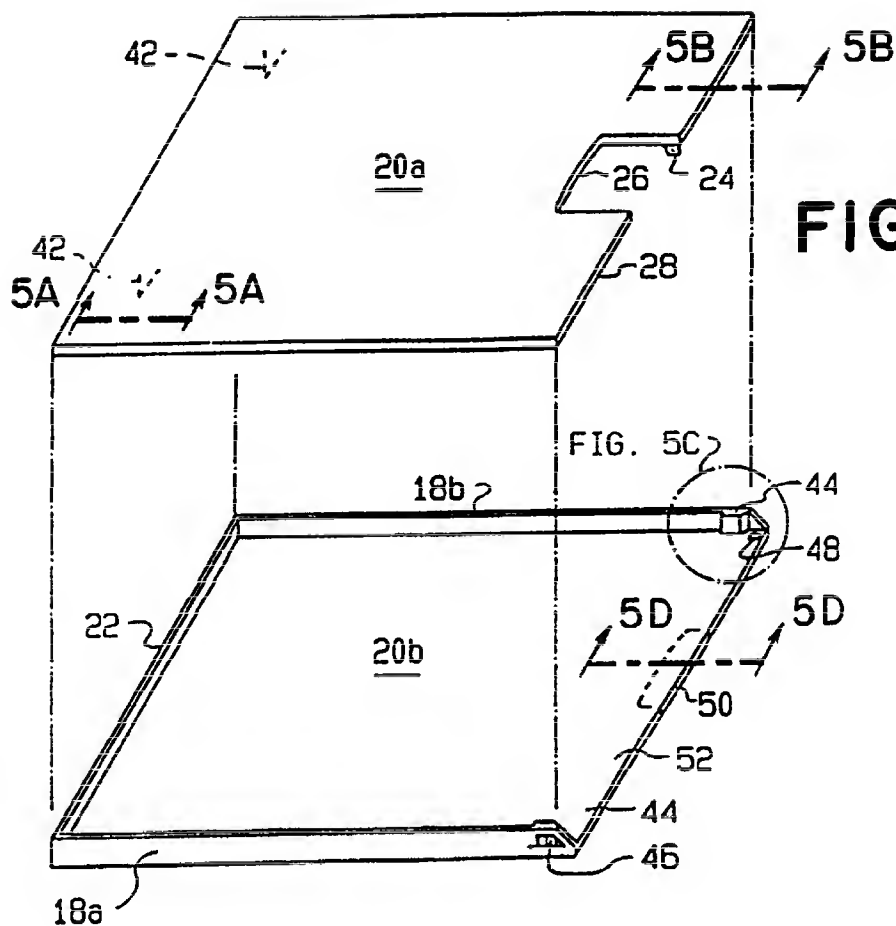


FIG. 5

FIG. 5A

FIG. 5B

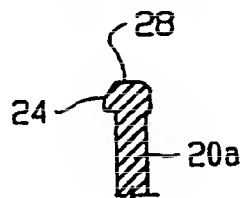
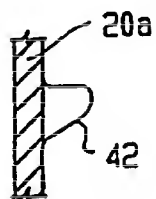
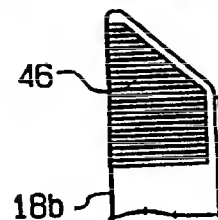
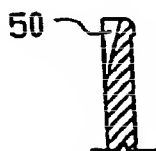
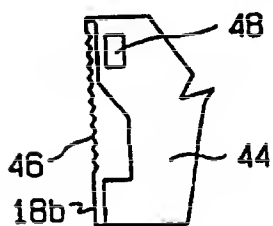


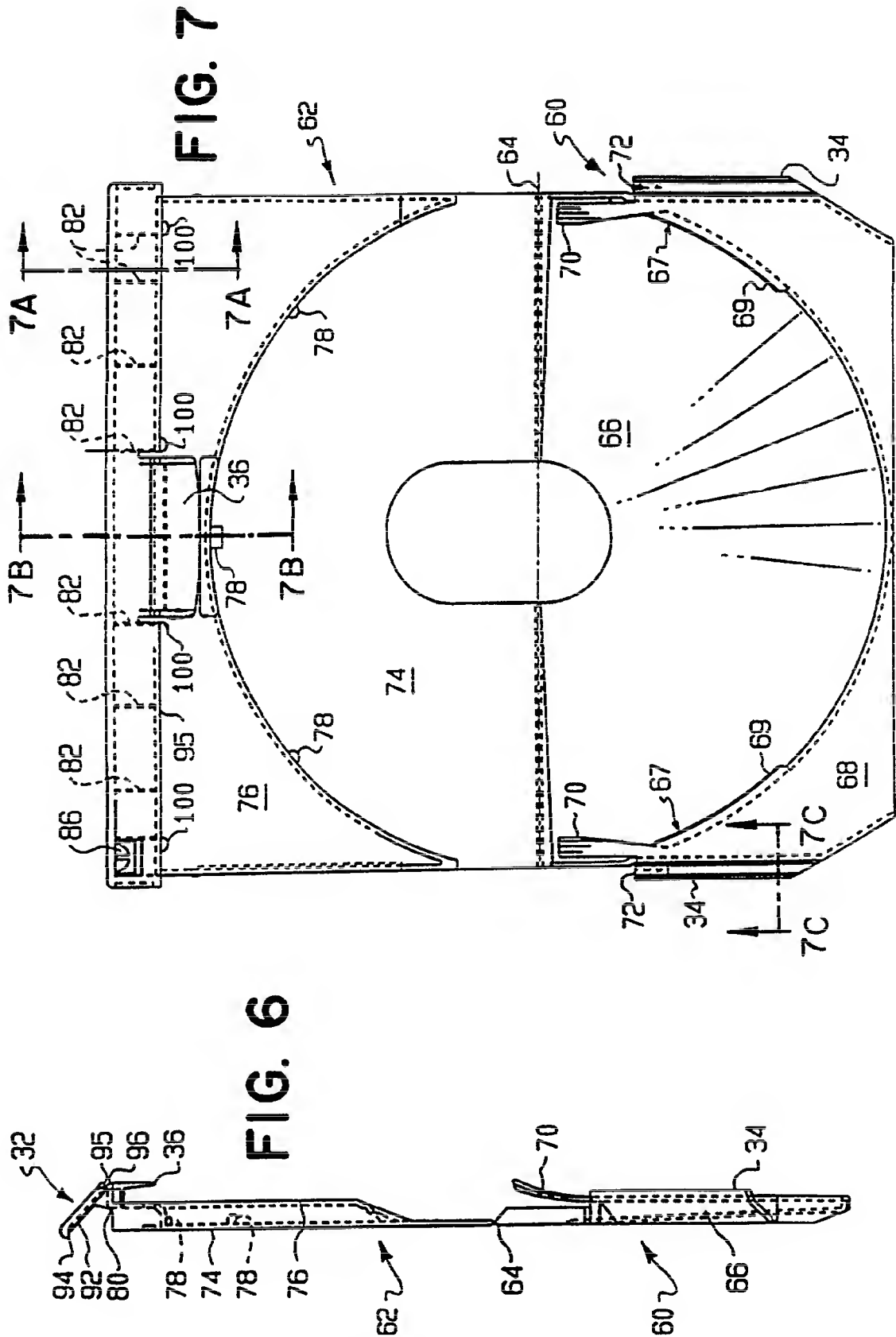
FIG. 5C

FIG. 5D

FIG. 5E



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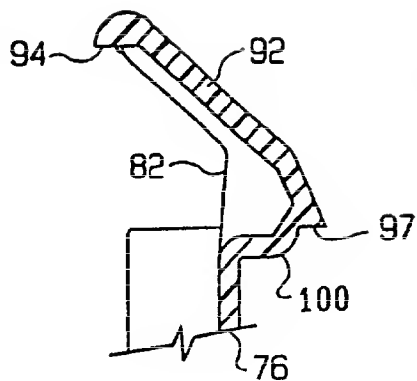


FIG. 7A

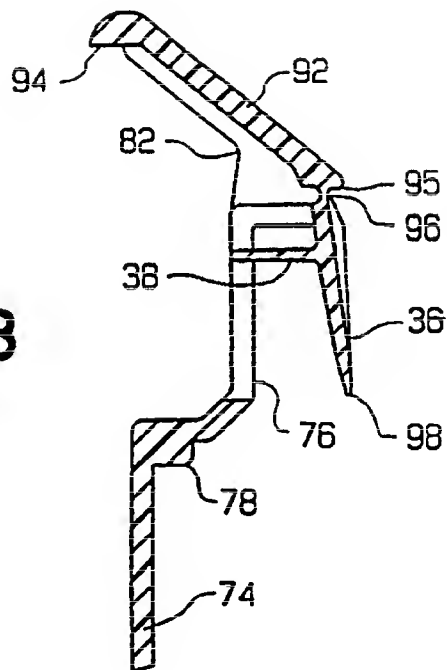


FIG. 7B

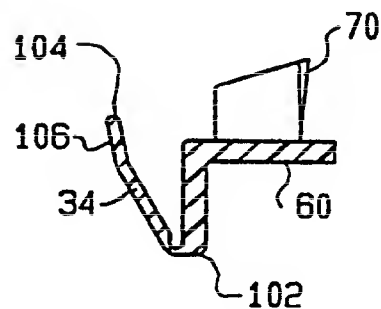


FIG. 7C

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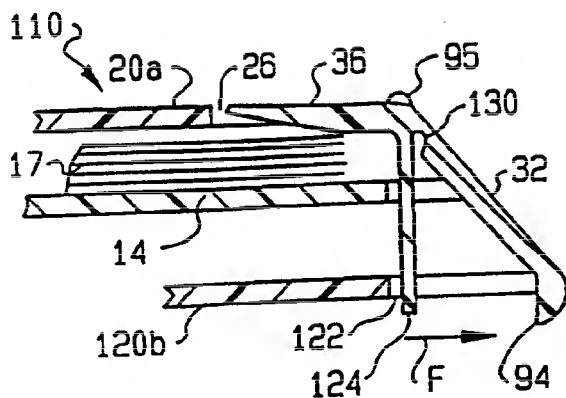


FIG. 8

FIG. 9A

FIG. 9

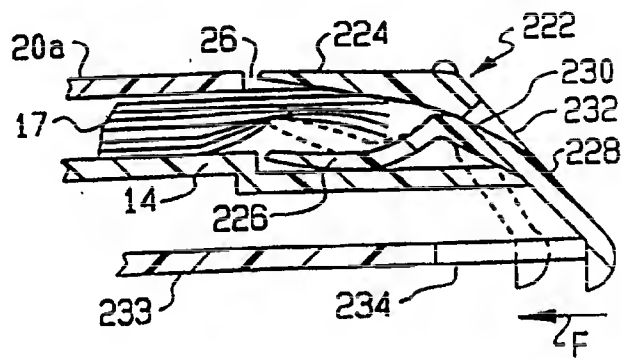
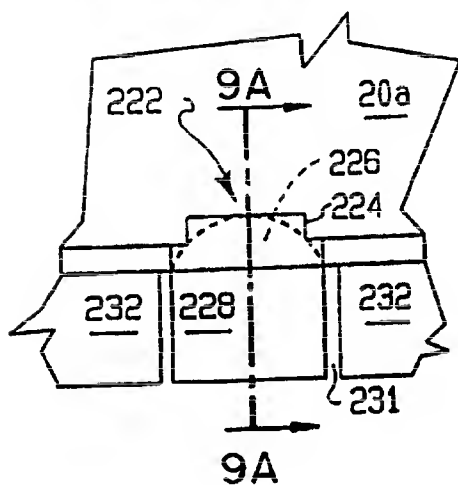
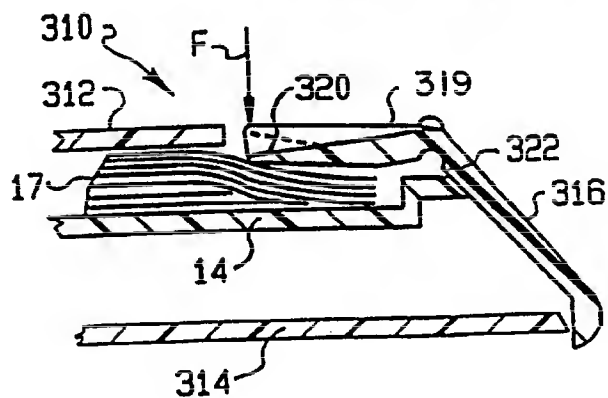
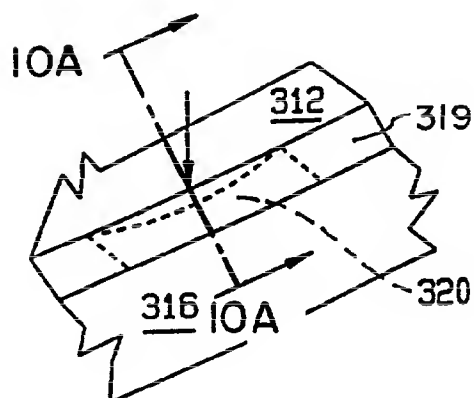


FIG. 10A

FIG. 10



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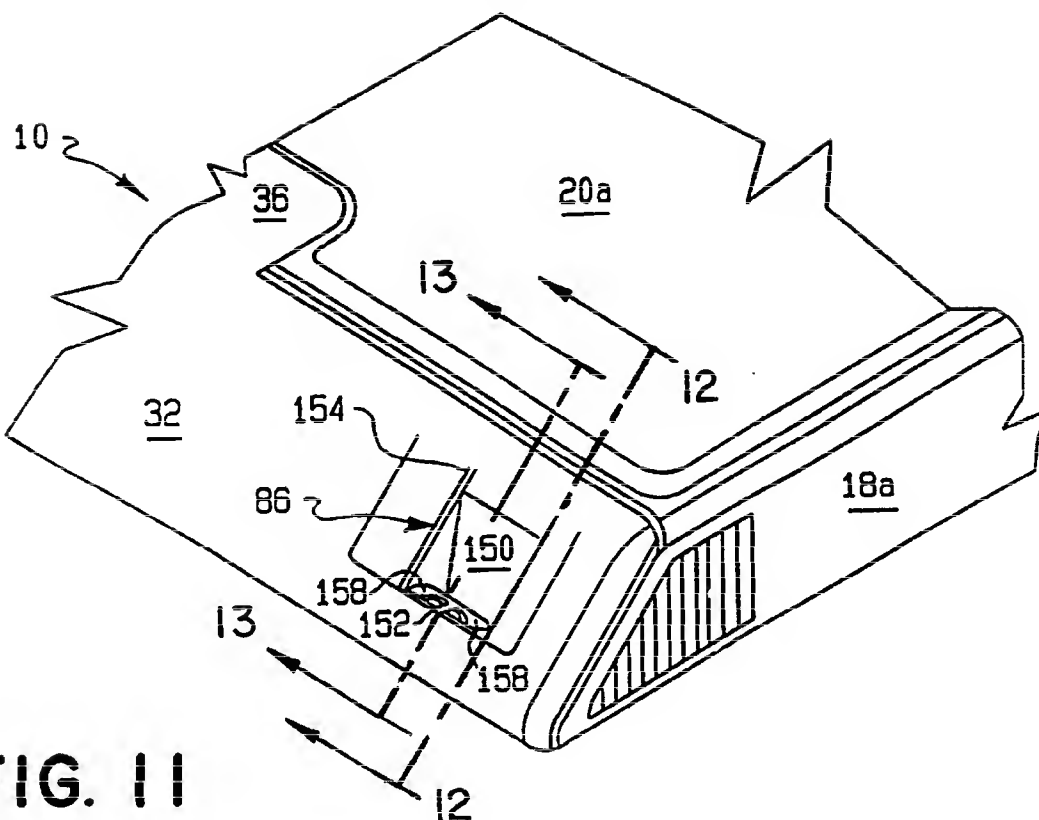


FIG. 11

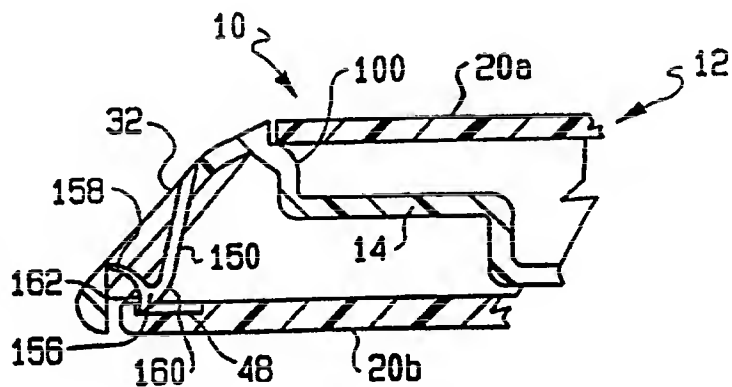


FIG. 12

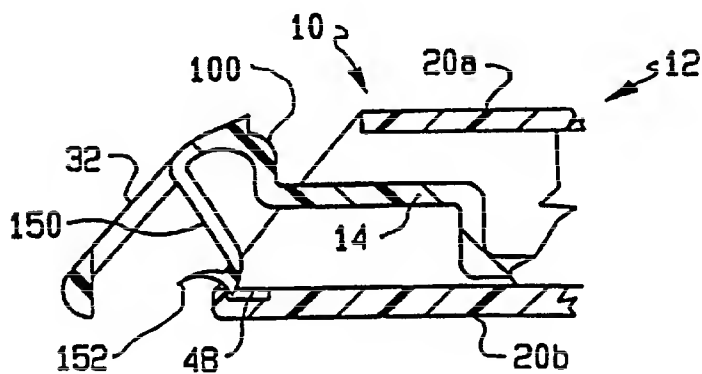


FIG. 13

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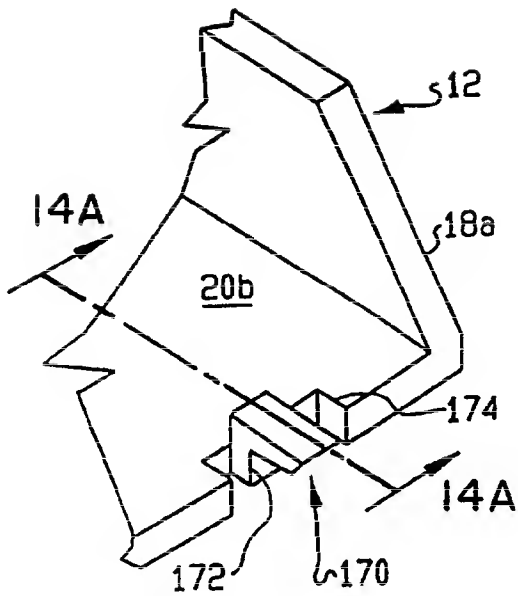


FIG. 14

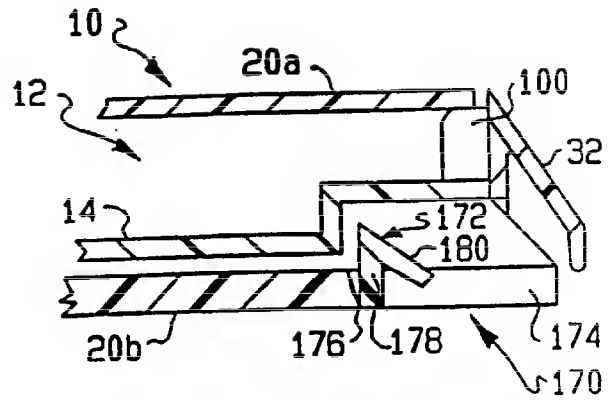


FIG. 14A

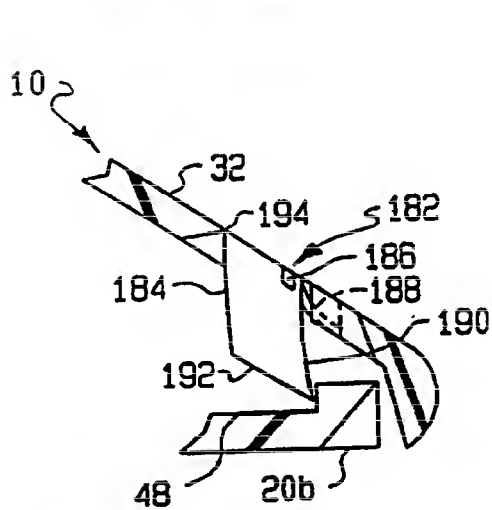


FIG. 15

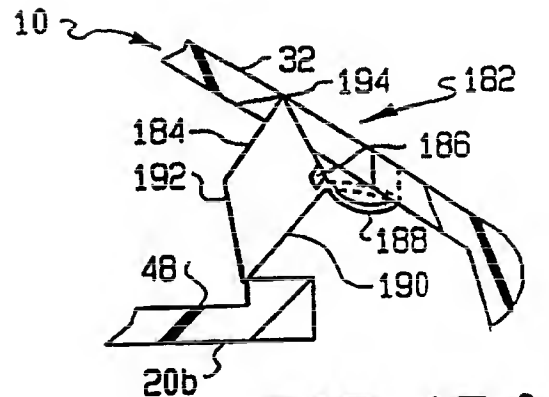


FIG. 15A

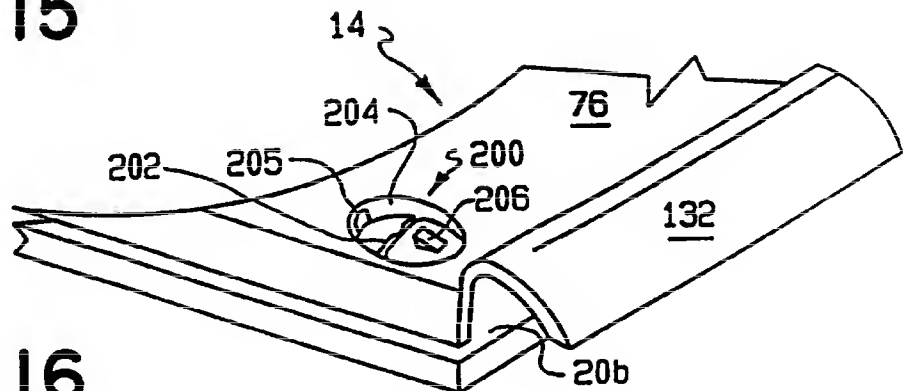
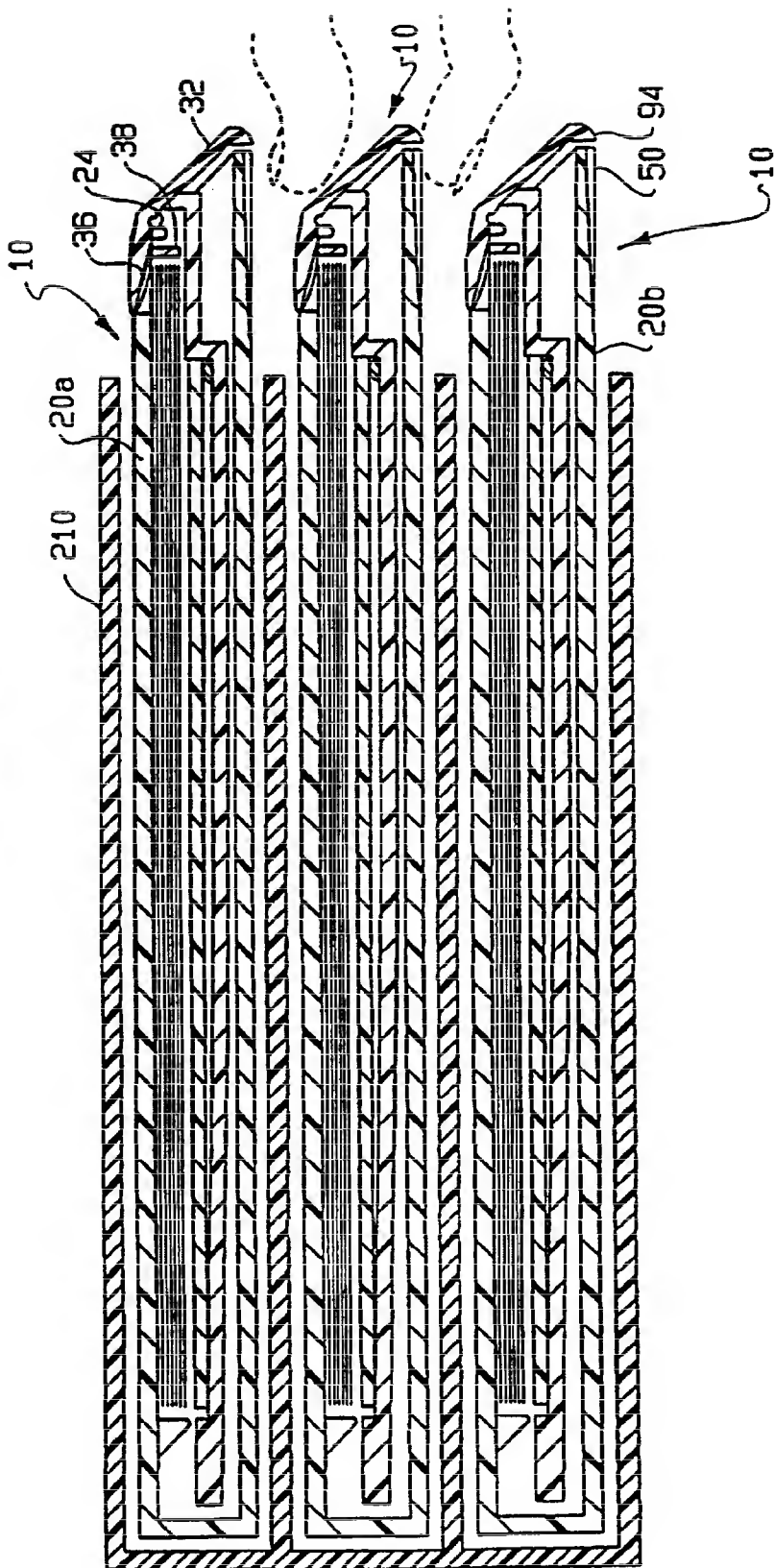
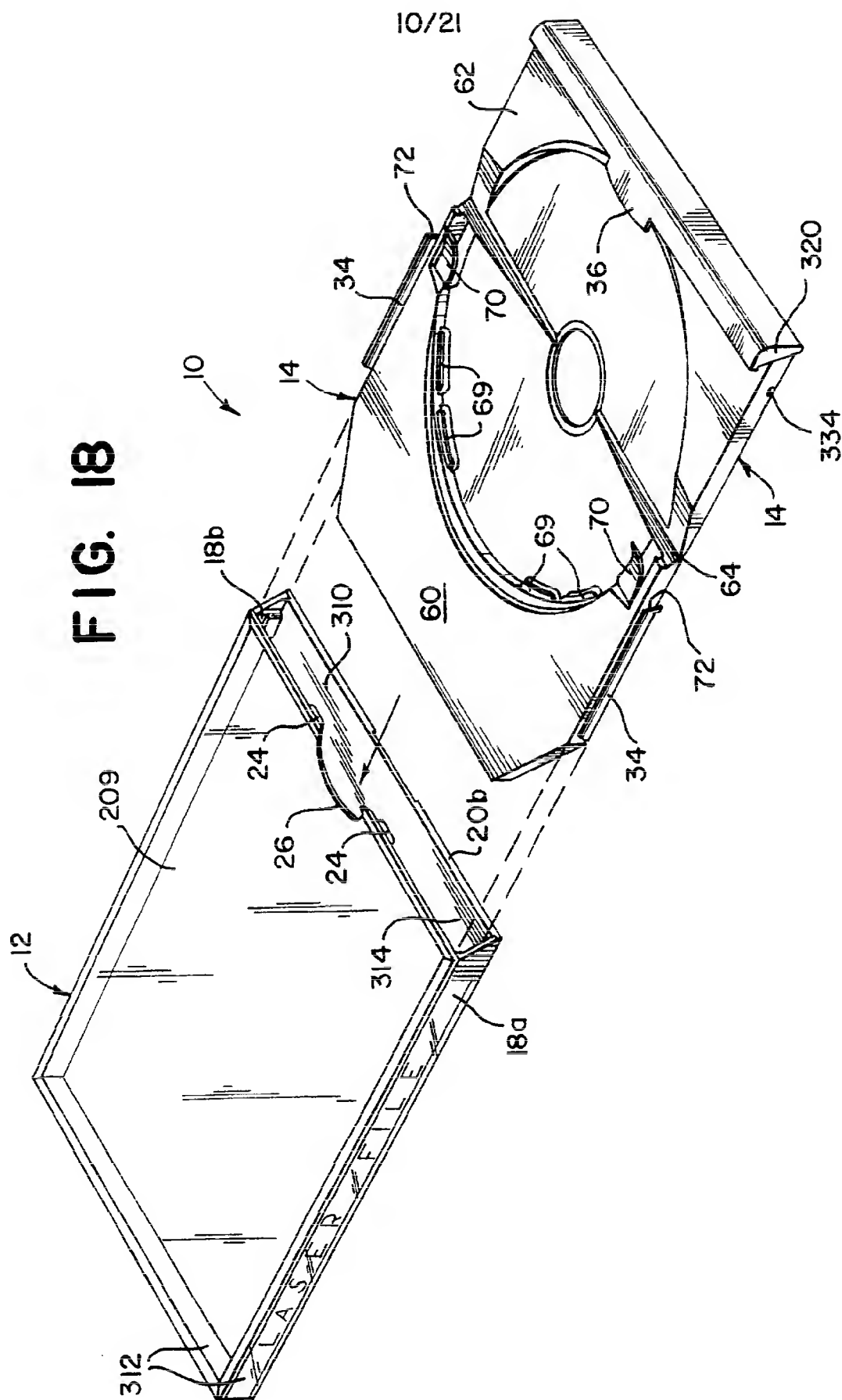


FIG. 16

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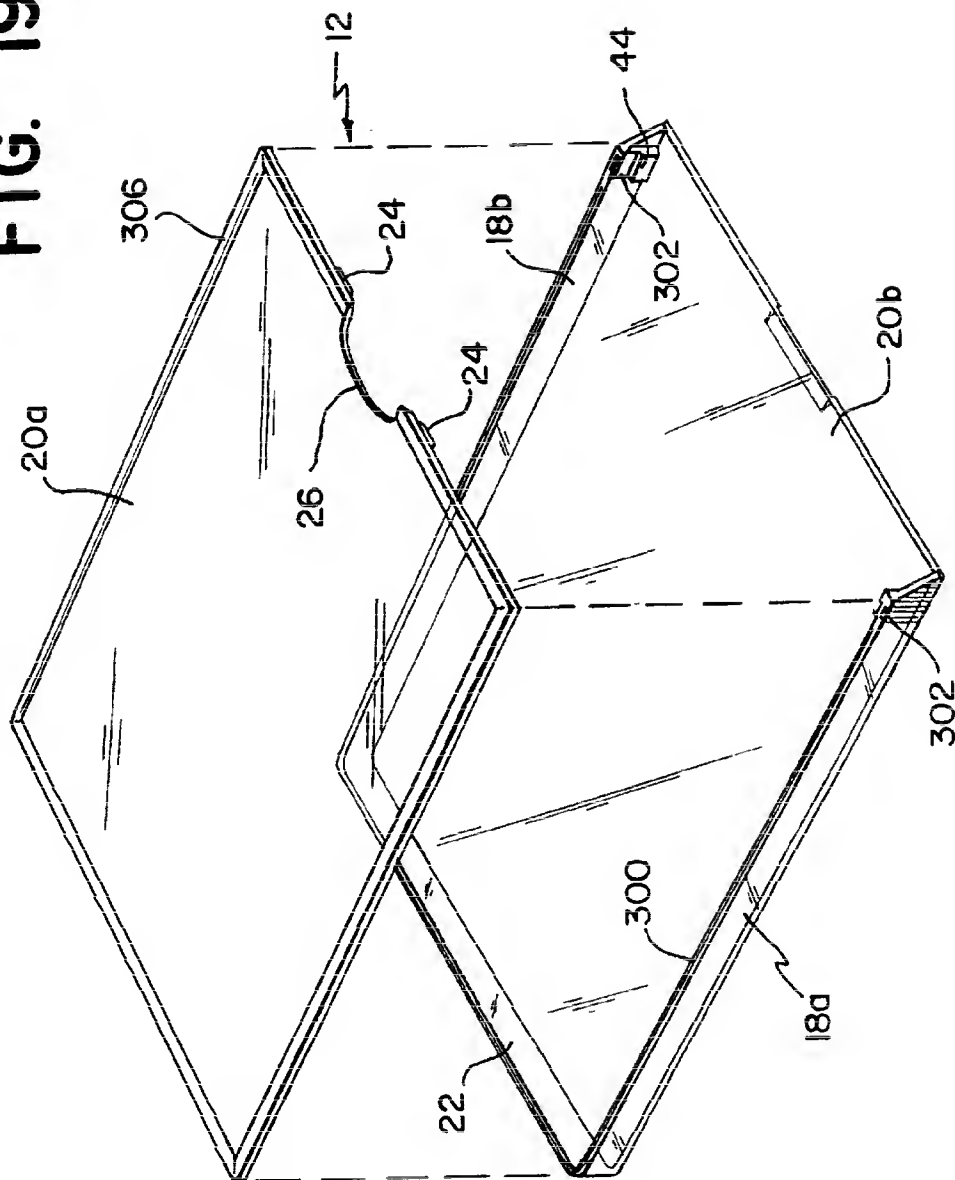
FIG. 17





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FIG. 19



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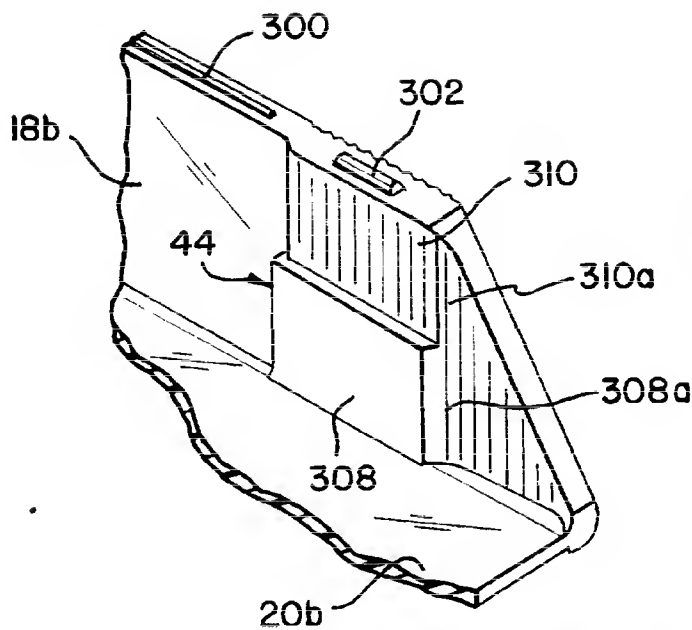


FIG. 20

FIG. 21

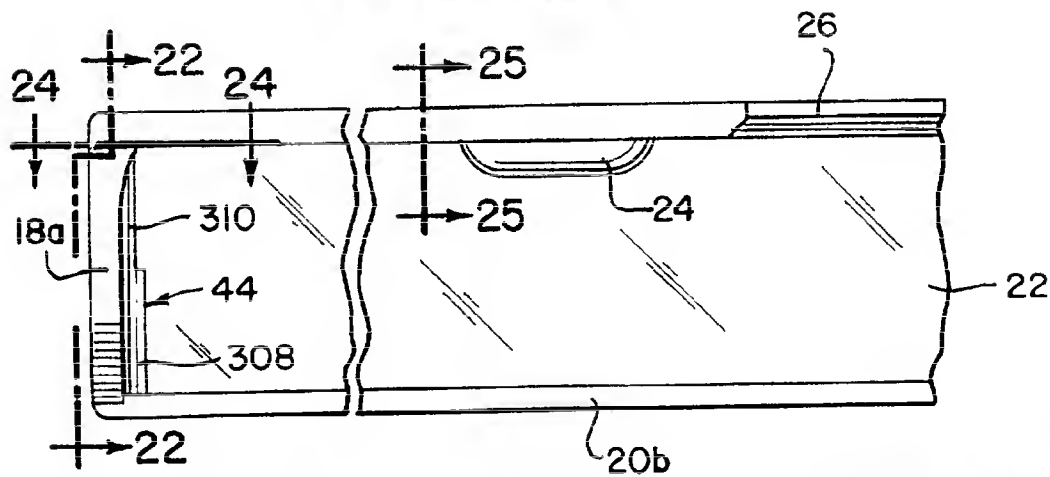


FIG. 22

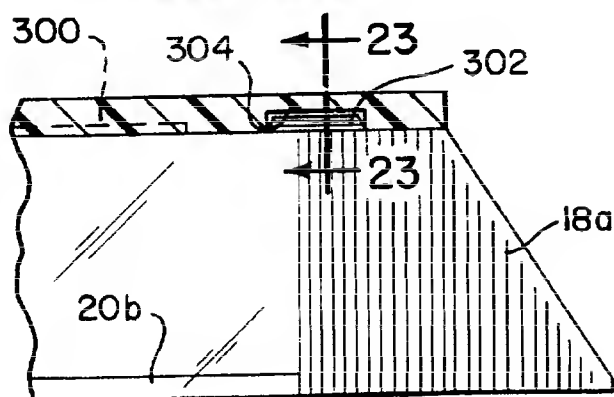
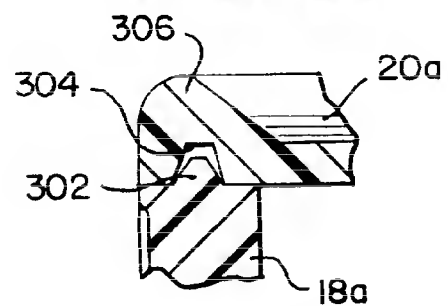


FIG. 23



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FIG. 24

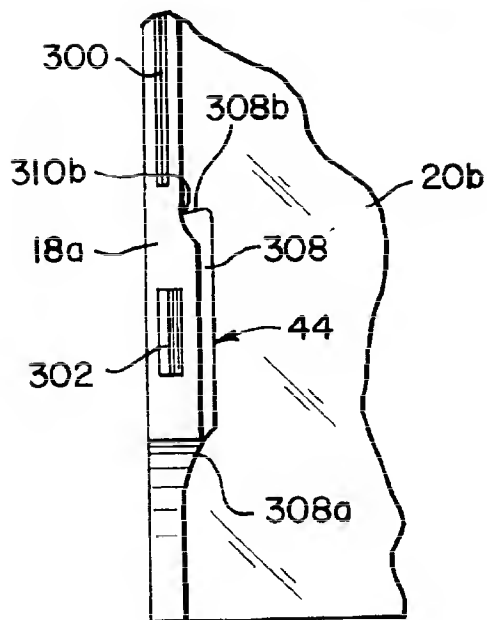


FIG. 25

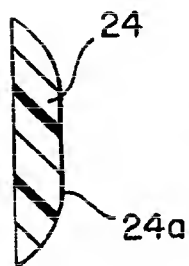
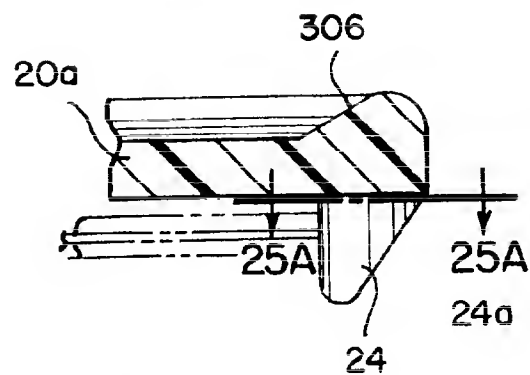


FIG. 25A

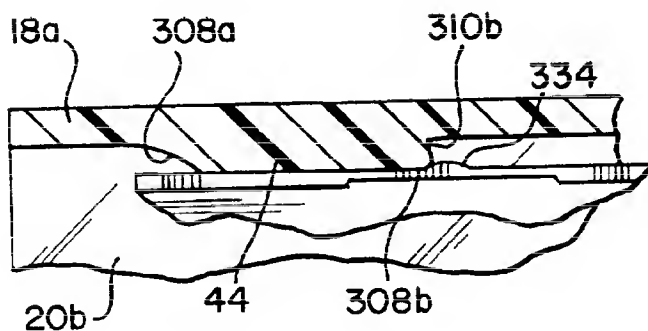


FIG. 26

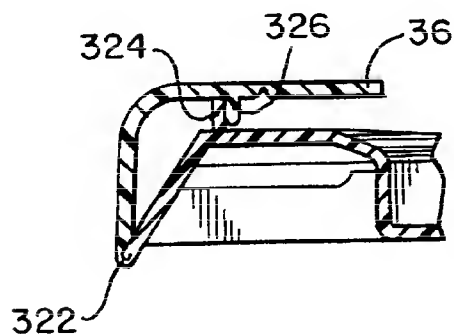


FIG. 32

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FIG. 22

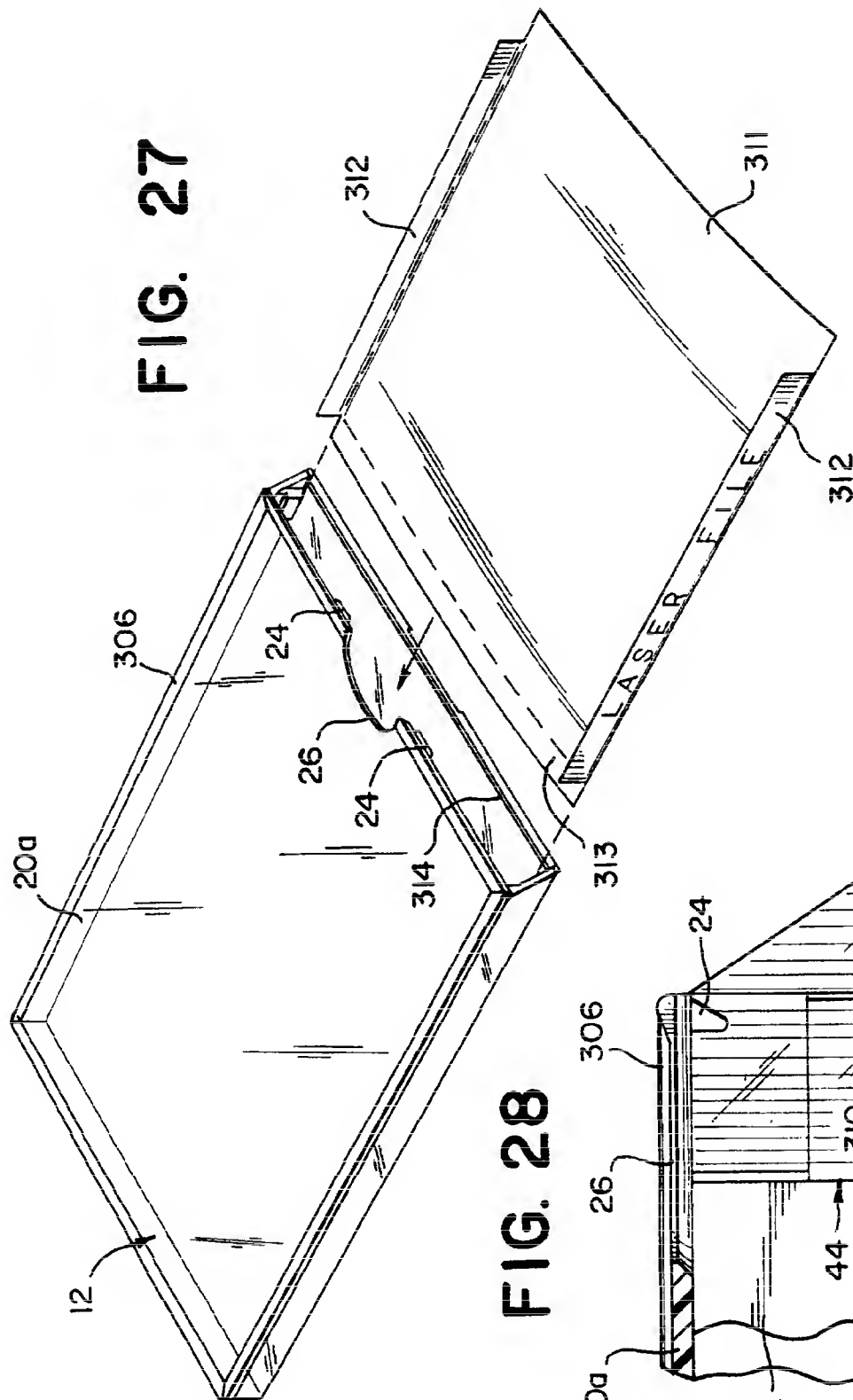
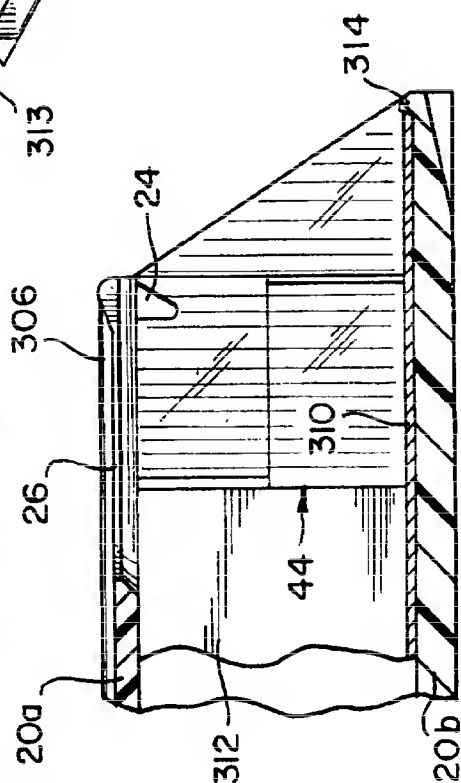
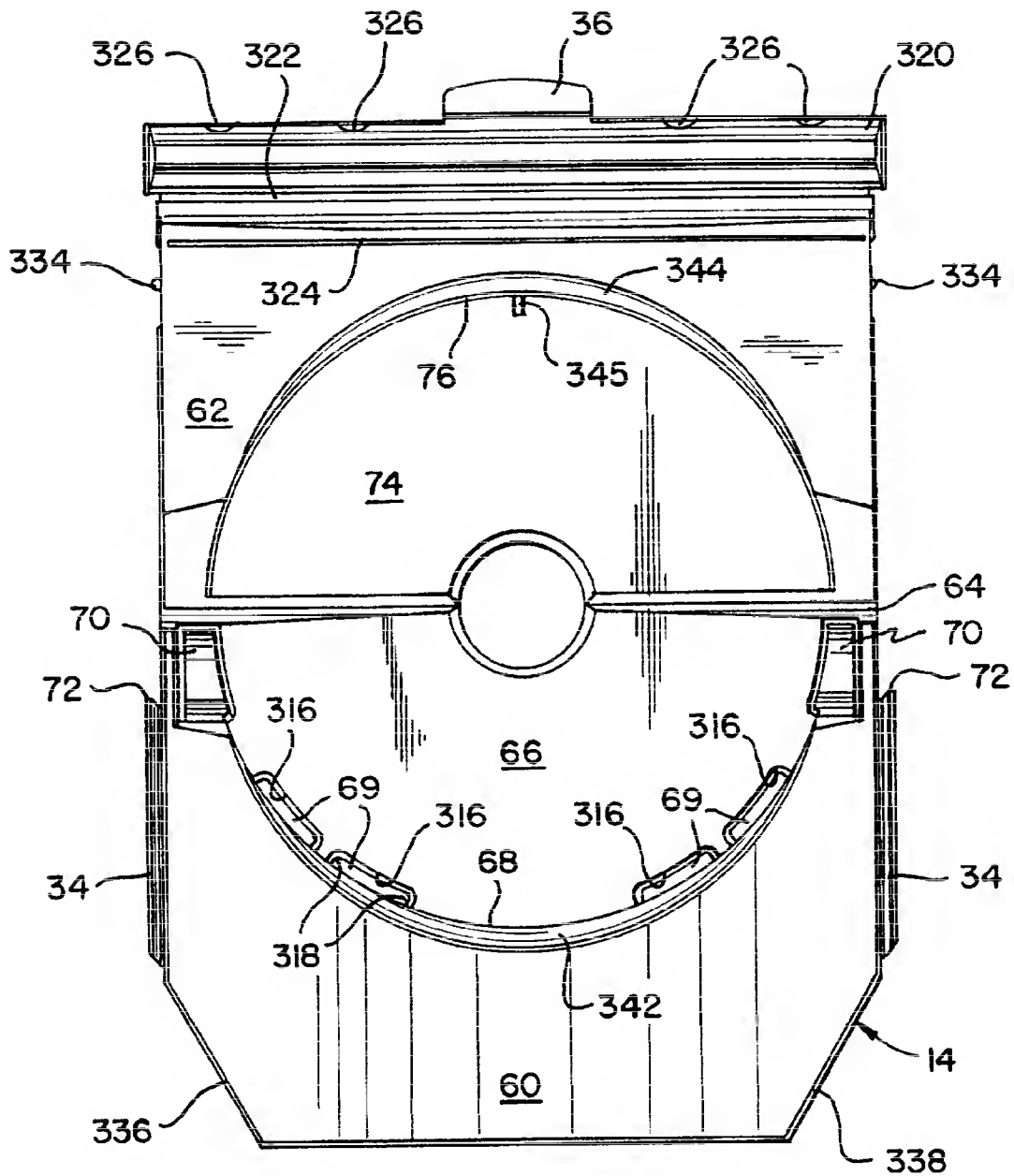


FIG. 28



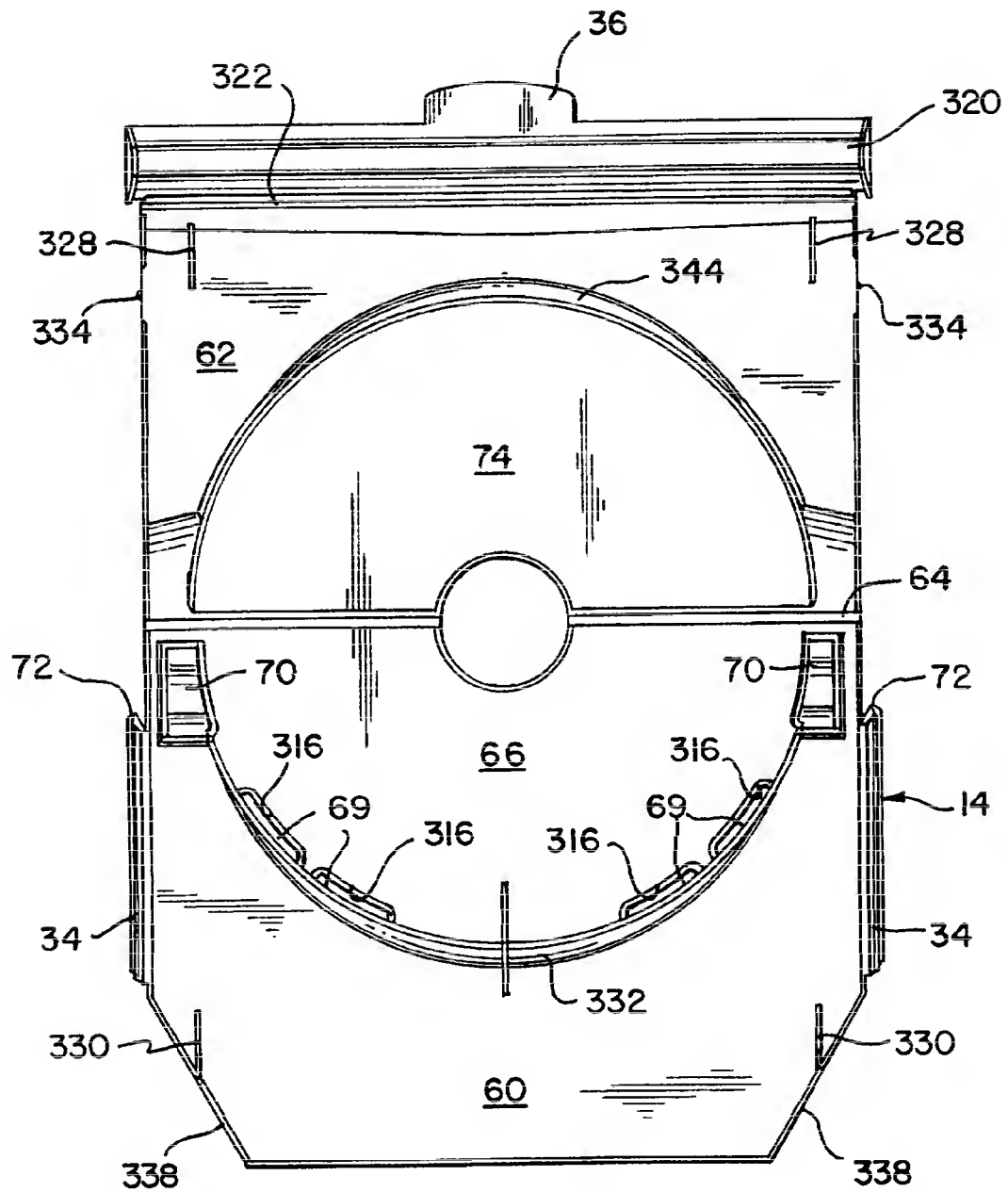
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FIG. 29



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FIG. 30



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FIG. 31

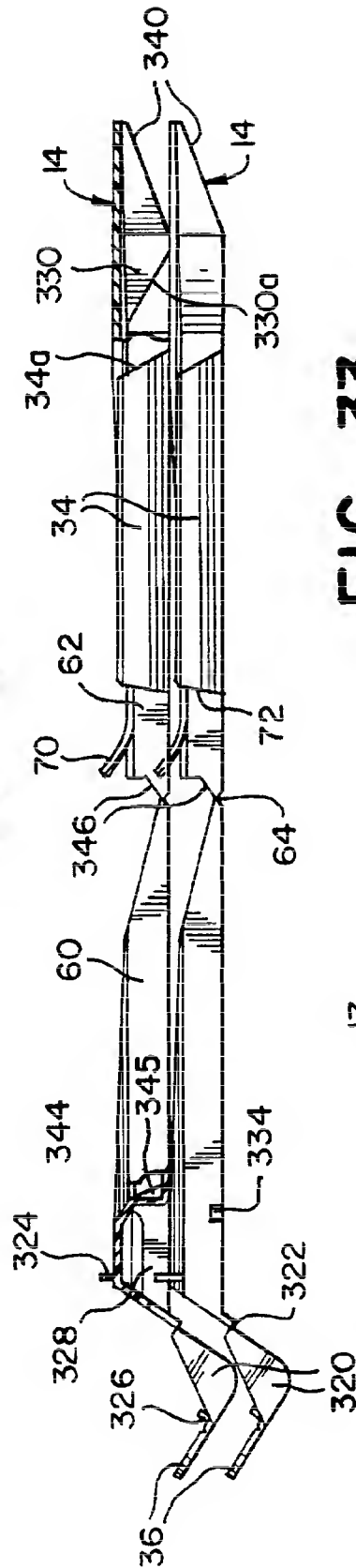


FIG. 33

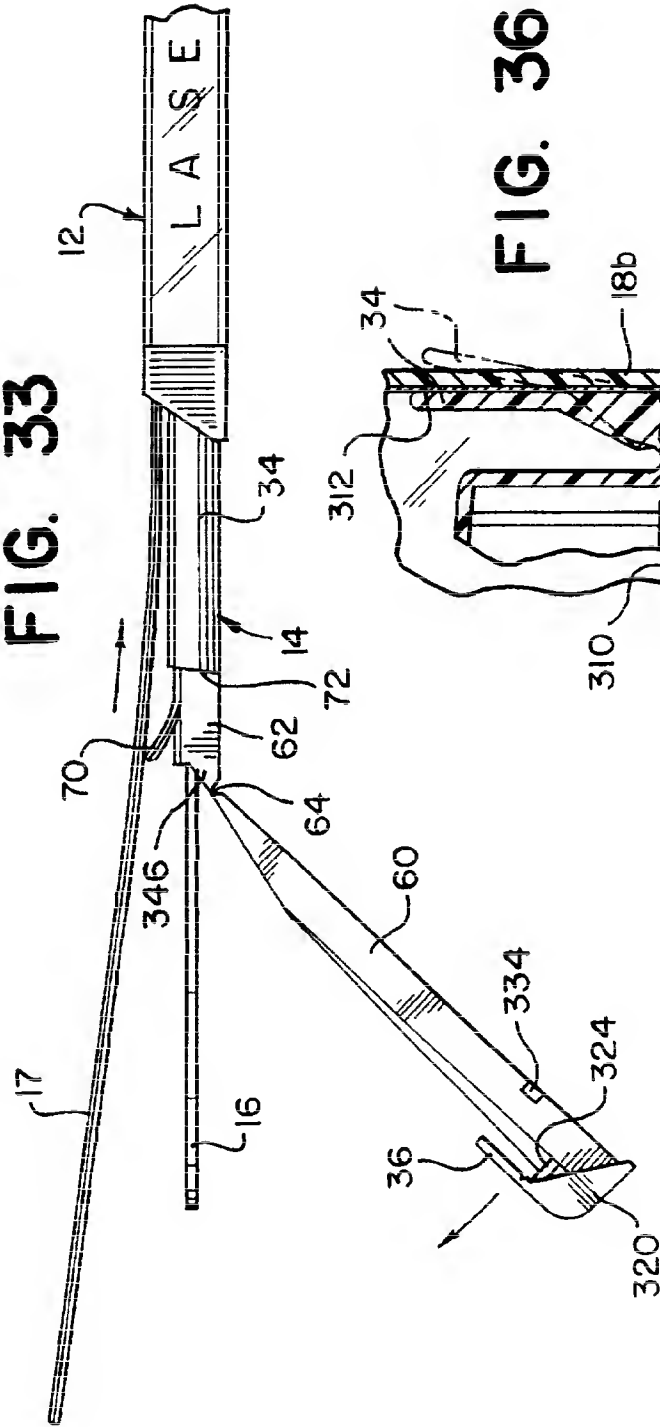
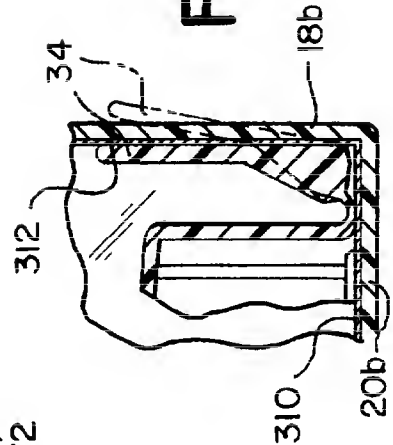


FIG. 36



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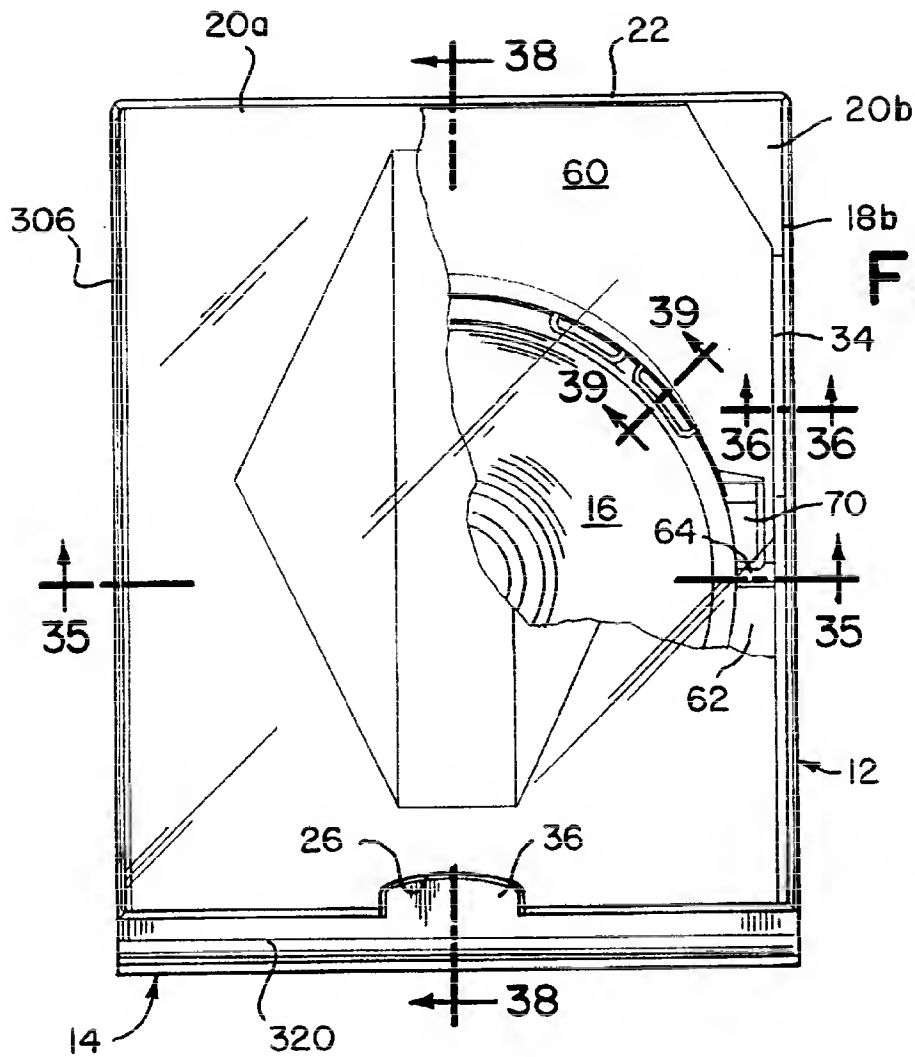


FIG. 34

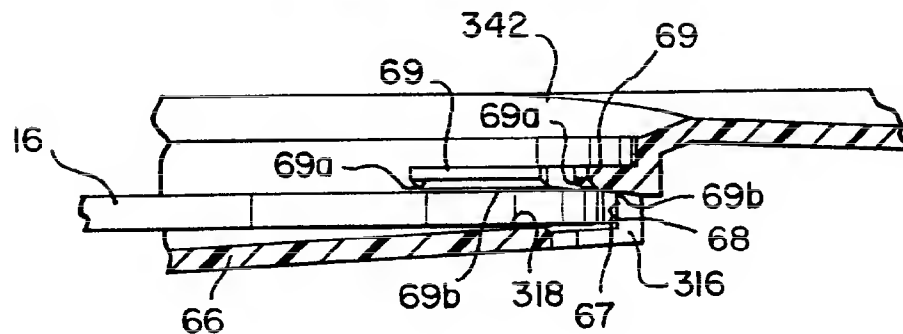


FIG. 39

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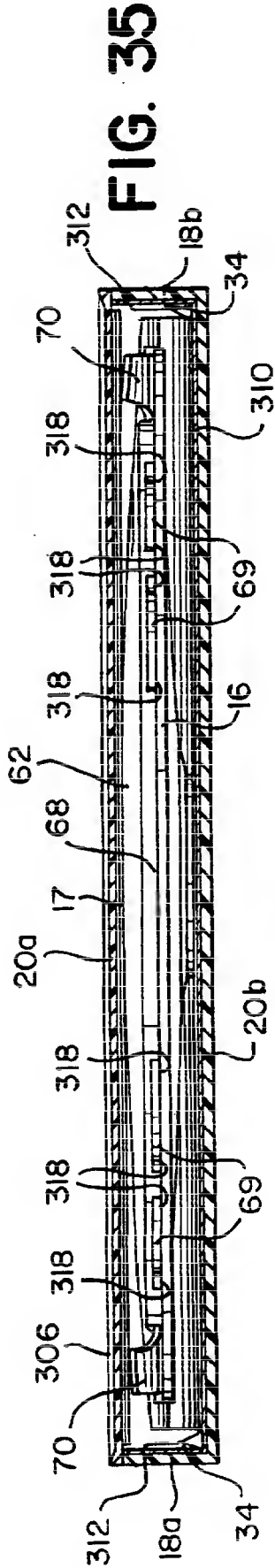


FIG. 35

FIG. 38

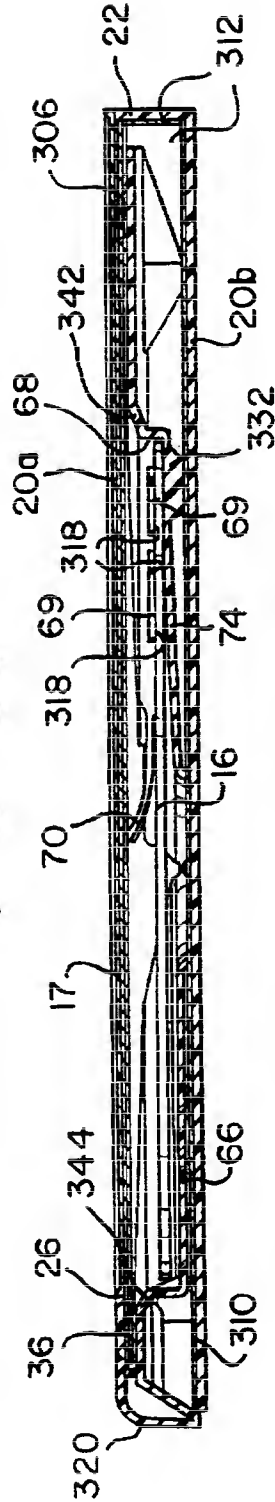
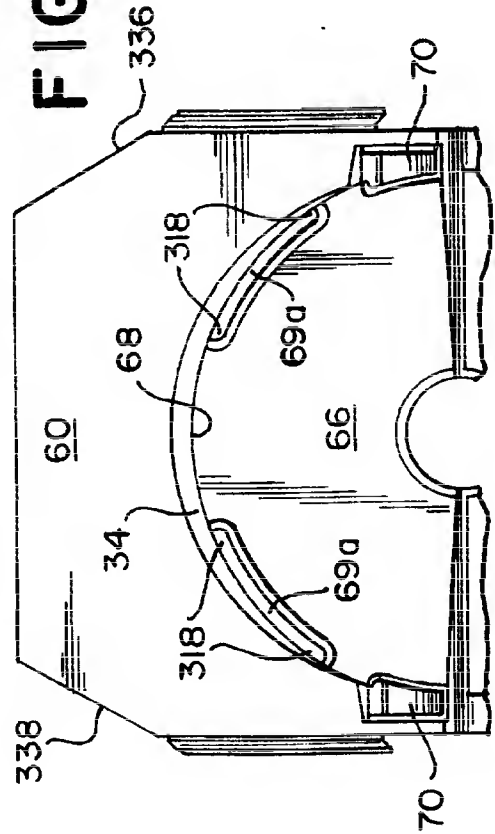
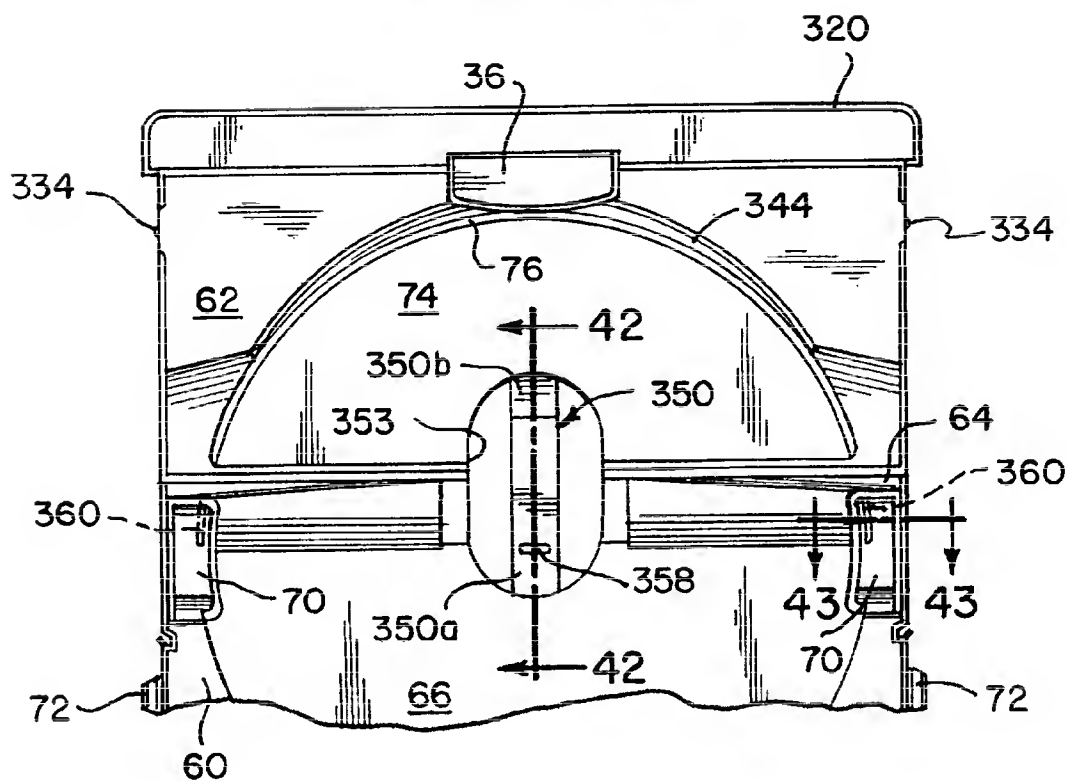
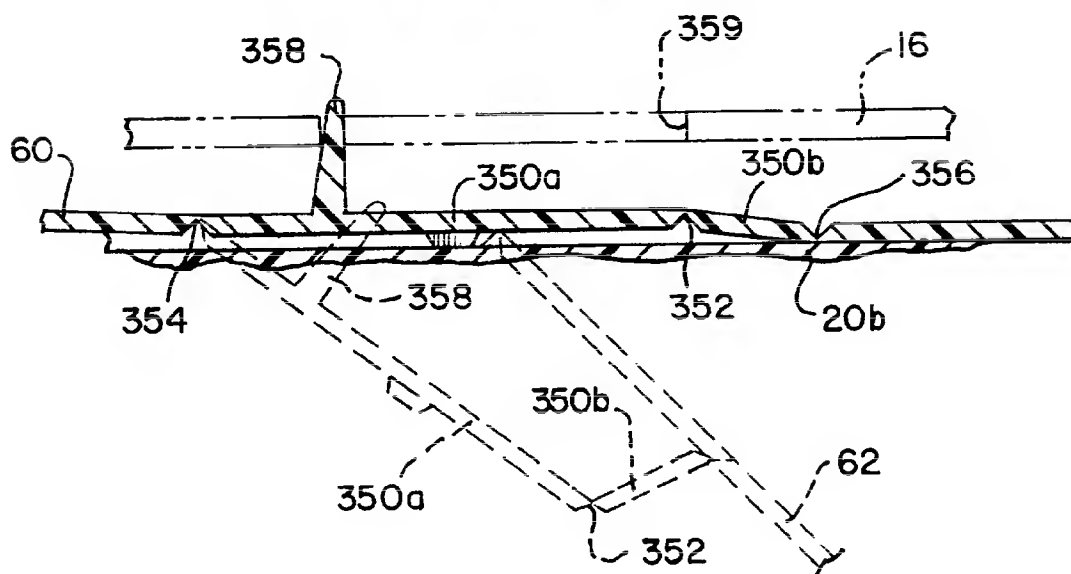


FIG. 40



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FIG. 41**FIG. 42**

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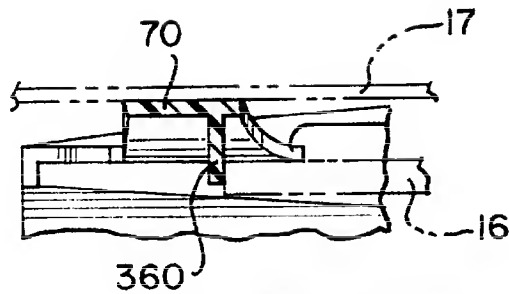


FIG. 43

FIG. 44

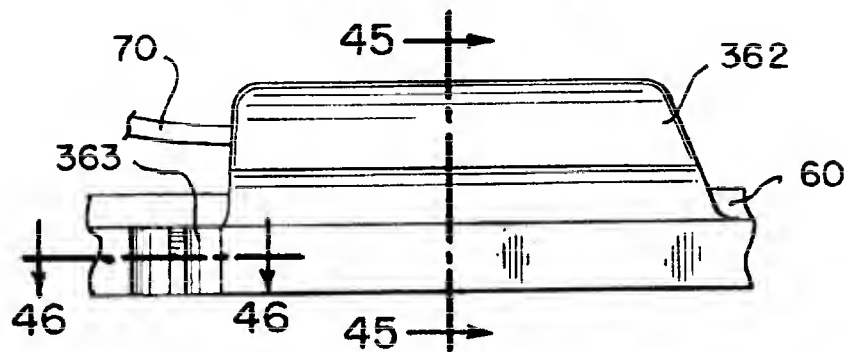


FIG. 45

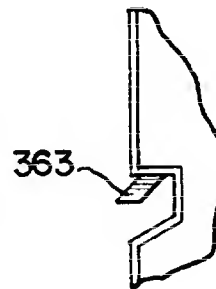
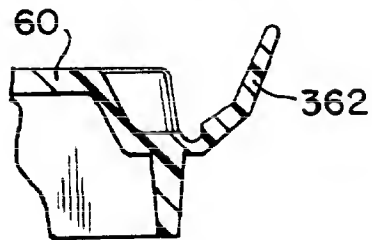


FIG. 46

FIG. 47

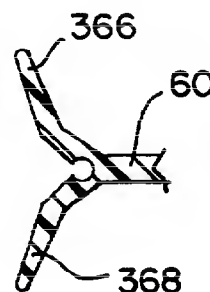
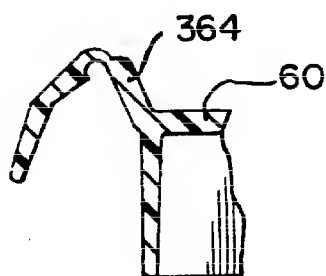


FIG. 48

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/18018

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B65D 85/57; G11B 33/00

US CL :369/291; 360/133; 206/308.1; 206/232; 206/308.3; 206/555; 206/804

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 369/291; 360/133; 206/308.1; 206/232; 206/308.3; 206/555; 206/804 ; 206/309-313; 312/9.47; 312/9.48

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS, GPIC 1.1

search terms: booklet, printed matter; cassette, cartridge, casing, tamper, disc or disk, drawer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 5,445,265 A (HERR et al) 29 August 1995, see entire document.	1-12, 16, 19-28, 32, 35-43
Y	US 5,263,580 A (CIBA et al) 23 November 1993, elements (37, 38, 36B, 37a, 38, 38a, 38b).	13-15, 17, 18, 29-31, 33, 34, 44-51
Y	US 4,635,792 A (YAMADA et al) 13 January 1987, figs. 11, 14, 15; elements (112, 112a, 114).	13-15, 29-31, 34 44-50
		17, 18, 33, 34, 48, 49, 51

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
B earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G*	document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means		
P document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

25 NOVEMBER 1997

Date of mailing of the international search report

06 FEB 1998

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Washington, D.C. 20231

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